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THE HUMAN REQUIREMENTS OF THIAMINE

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THERE is great need for additional information on the human requirements of thiamine because of the conflicting nature of the evidence at present available and the use of this evidence in the formulation of national standards and policies as applied to food. The general subject has been recently well reviewed by Holt[1] and no further résumé of the literature will be attempted.

In 1939-40 four dietary surveys were carried out simultaneously in Halifax, Quebec, Toronto and Edmonton as part of a plan of the Council on Nutrition to determine the status of nutrition in the urban population of Canada. In Halifax the survey extended over nine months from September, 1939, till May, 1940. The general results have already been published.[2] The group surveyed comprised 385 individuals in 82 families and the representative character of this group has been assessed as satisfactory by the Dominion Bureau of Statistics. The average family consisted of 4.7 individuals. The average income per family was $1,023 with a range of $450 to $1,500 per annum, which represented about 60% of the Halifax population at that time. The survey was carried out by the individual method with records of the food consumed by each member of the family during the course of one week. Corrections were made for edible and inedible wastage. The consumption of individual nutrients was then calculated from standard food tables. The values for thiamine were taken from the tables of Daniel and Munsell[3] and Fixsen and Roscoe.[4] Inaccuracies in these figures must be taken into consideration in drawing final conclusions.

The results showed that the average consumption of thiamine was 0.63 mgm. per head per day, with an average intake of 2,524 calories. The mean intake for men was 0.54 mgm. with a range of 0.26 to 1.04 mgm. and a mean of 0.39 mgm. for women, with a range of 0.22 to 0.84 mgm. The Canadian standard for optimum health was at that time accepted to be 1.5 mgm. and the whole group was therefore distinctly below the standard adopted and *all* below even 70% of the standard, deducting the usual margin of safety allowed. Similar results were obtained in the other Canadian dietary surveys. These results were not convincing of actual deficiencies to the author by virtue of the fact that in many instances the other nutritive elements in the diets were present in much greater than optimum amounts. The individual results have therefore been re-analyzed on the basis of the ratio of thiamine to total and non-fat calories.

There is sufficient evidence in the literature to establish that a relationship exists between the amount of thiamine required and the caloric value of the diet. This is substantiated by our knowledge of the physiological function of thiamine as an essential part of the carboxylase system for the normal utilization of carbohydrates. It is more strictly true if calculated to the non-fat caloric value of the diet. Thus Williams and Spies[5] have estimated that the ratio below which beri-beri would likely appear was 0.3 mgm. per 1,000 non-fat calories from a consideration of published data. McHenry[6] has expressed this graphically, using figures from many sources, and reaches the conclusion that 0.19 mgm./1,000 total calories on a fat-free diet provided a minimum ratio for various species. The figures presented below for the Halifax survey are taken from diets which contained calories from fat at a level of 42% both for men and women. McHenry draws the conclusion that for this level the minimum requirement for thiamine would be approximately 0.17 mgm. per 1,000 total calories. Other investigators have placed this figure, using different criteria, between 0.23 and 0.5 mgm./1,000 cal.

TABLE I.

THIAMINE IN MILLIGRAMS PER 1,000 CALORIES

	Maximum	*Minimum*	*Mean*
Men	0.43	0.13	0.20
Women	0.43	0.12	0.19
Children	0.45	0.09	0.22
1 - 3 years	0.27	0.15	0.21
4 - 6 years	0.32	0.15	0.23
7 - 10 years	0.45	0.12	0.23
11 - 12 years	0.33	0.13	0.23
13 - 15 years	0.26	0.09	0.20
16 - 18 years	0.34	0.13	0.21

TABLE II.

THIAMINE IN MILLIGRAMS PER 1,000 NON-FAT CALORIES

	Maximum	*Minimum*	*Mean*
Men	0.81	0.25	0.37
Women	0.79	0.21	0.35
Children	0.83	0.18	0.37
1 - 3 years	0.49	0.22	0.34
4 - 6 years	0.57	0.22	0.40
7 - 10 years	0.83	0.20	0.39
11 - 12 years	0.71	0.22	0.40
13 - 15 years	0.71	0.18	0.35
16 - 18 years	0.59	0.22	0.36

It is apparent from Tables I and II that the averages for all groups are numerically remarkably close. There is a slight indication that children between 4 and 12 years consume a diet slightly higher in the thiamine/calorie ratio. The level of consumption of thiamine at approximately 0.21 mgm. is of particular significance. It is representative of a group with no clinical polyneuritis despite numerous intakes of 0.12 to 0.15 mgm.—amounts far below the 0.6 mgm. ratio recommended by the U.S. Food and Nutrition Board and the Canadian Council on Nutrition. Some of the figures in this survey are well within the range recognized as associated with beri-beri on low fat diets.[5] They represent a daily requirement for this group more in keeping with the figure suggested by Ferguson, Luson and McHenry at 0.11 mgm.,[7] and those of Keys and associates[8] at 0.23 mgm., of Najjar and Holt[9] at 0.15 mgm., of the lowest figure of van Veen[10] at 0.24 mgm., and of Arnold and Elvehjem[11] at 0.11 mgm. for dogs, as determined by various criteria. If calculated at 0.11 mgm. as the minimal requirement for this group only 2% would be deficient in dietary thiamine. If 0.15 mgm. were accepted as the standard the percentage would rise to 10; if 0.17 mgm. it would be 23 and if 0.23 mgm. it would reach 61. The probable minimal level might thus be placed at 0.11 to 0.17 mgm. per 1,000 total calories on general findings of undernutrition from the usual clinical examination or on the basis of body weight as in the nutritional surveys in East York Township by Riggs *et al.* (1943) or in North Carolina by Milam and Anderson (1944).

It is of importance in this connection to calculate the thiamine/calorie ratio in human milk. Jeans[12] lists the content of thiamine as between 2 and 36 γ per 100 gm. with a mean of 13 γ which is equivalent to 0.20 mgm./1,000 cal. Using the average figure calculated from Kendall's[13] results the ratio would be 0.05. It is also of interest to note from recent statistics,[14] that thiamine has been available to Canadians at a level of 0.72 mgm. per 1,000 cal. in 1944 as contrasted with 0.62 mgm. between 1935 and 1939 without consideration of losses in storage or cooking.

From the evidence presented of diets consumed by this limited economic group in Halifax it would seem that the present standards are too high and that a false picture of deficiency in thiamine has been obtained. It is not claimed that the mean values cited are to be considered optimal intakes but rather are they to be evaluated as evidence towards the establishment of minimal values consistent with good health in the clinical sense.

SUMMARY

An analysis of the data of a dietary survey carried out by the individual method amongst families receiving incomes of $450 to $1,500 per annum in Halifax has been done relative to the intake of thiamine expressed per 1,000 calories. This survey included 385 individuals in 82 families. The average consumption was 0.20 mgm. for men with a range of 0.13 to 0.43, per 1,000 total calories, 0.19 mgm. for women with a range of 0.12 to 0.43, and 0.22 mgm. for children with a range of 0.09 to 0.45. Expressed on the basis of non-fat calories the averages were 0.37, 0.35 and 0.37 mgm. respectively. In no case was clinical thiamine deficiency evident.

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RÉSUMÉ

385 individus représentant 82 familles de Halifax dont les revenus annuels variaient de $450 à $1,500 ont été soumis à une enquête pour déterminer la quantité de thiamine ingérée par 1,000 calories. La consommation moyenne a été de 0.20 mgm. pour 1,000 calories pour les hommes, de 0.19 mgm. pour les femmes et de 0.22 mgm. pour les enfants. Exprimées en calories,—abstraction faite des graisses,—les moyennes furent respectivement de 0.37, 0.35, et 0.37 mgm. Aucun sujet observé n'a donné de signes cliniques de carence en thiamine.

JEAN SAUCIER

AIR-BORNE FUNGUS SPORES IN MANITOBA*

(A Six-Year Survey, 1939-1944)

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IN 1924 Cadham[1] reported three cases of asthma in Manitoba due to rust spores. He was the first on this continent to advance the idea that air-borne spores of fungi might act as inhalant allergens. In the same year, Van Leeuwen, in Holland, showed that spores occurring in the miasms of the low country caused asthma. Since that time a great volume of evidence has accumulated, especially in the U.S.A., which shows that air-borne spores are indeed most important causes of hay fever and asthma. In the mid-west it would appear that they are second only to pollen in importance. An excellent review of the subject is given in Feinberg's[2] recent book.

We had noticed for some time that there were a number of seasonal cases of hay fever and asthma occurring in Manitoba and western Canada, which could not be explained adequately by pollen alone. In our surveys of air-borne pollen in this region, we noticed that our slides contained many fungus spores.[3] Durham[4] showed in 1933 that fungus spores occurred in Winnipeg in significant numbers. The present study was commenced in the spring of 1939 and carried on throughout each year until the end of 1944.

Man may be sensitive to the spores of fungi in the same way as he is to any other allergen. Most of them are not pathogenic, although a few, such as actinomyces, may act as infecting agents or as allergens. Many are not even pathogenic to plants and grow best on damaged or dead vegetation. The large numbers found in the air in the late autumn and on occasional dusty days in winter probably come from such sources. Rusts are of course true parasites and grow only on their living plant hosts. Accordingly, their season is strictly limited. Obviously the clinical importance of any spore will vary with its frequency and density of occurrence and with its allergenic toxicity. Our investigation was designed to determine what spores were to be found in the air in Manitoba, when they occurred and in what relative amounts.

METHODS

Studies were made in Winnipeg throughout the whole period of 1939-1944. Observations were also made in Kenora, Ont.; Brandon, Morden, Pierson, Le Pas, Dauphin, Melita, Vita and Russell, Man., during 1939-1941 only.

The properties of the various spores made it necessary to use three different methods of observation.

1. *Culture media.*—The spores of *Aspergillus, Penicillium, Mucor, Rhizopus, Yeast* and *Monilia,* because of their small size and similarity in morphological features, are exceedingly difficult, if not impossible, to identify. For this reason it was necessary to expose culture media in order that the spores might germinate and thus be identified and enumerated. Duplicate sterile petri dishes, containing sterile potato dextrose lactic acid agar media, were exposed horizontally every day from 1250 hours to 1300 hours near the slide stations on the roof of the Medical College, Winnipeg. It was found by experiment that this was the most suitable time of day and period of exposure to obtain an optimal observation. The plates were then left at room temperature for three or four days when the fungus colonies were counted. Further growth was then allowed to permit identification.

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From the Department of Medicine, University of Manitoba.

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Colonies which did not sporulate on the potato dextrose agar were transferred to cornmeal agar and in many cases were then identifiable. Due to the war, it was found impossible to continue culture studies beyond 1940, since one of us (D.) had to continue the study unaided.

2. *Stationary slides.*—The spores of *Alternaria, Hormodendrum* and *Helminthosporium* are readily identifiable on slides and of course their colonies are also identifiable on the culture media. Slide counts thus offered an interesting comparison with the culture data. Rust and smut spores do not germinate on artificial culture media, so that their study was made entirely from slides.

Microscopic slides, suitably coated, were exposed under rain shelters on stationary stands as described in our pollen survey report.[3] The slide stations were situated on the roof of the Medical College in Winnipeg and of a building in Brandon and at meteorological stations at the other towns and sites studied. The slides were exposed for twenty-four hours daily, and the spores found on them were identified as far as possible and counted. In each slide the spores were counted in twenty-five separate evenly spaced low power fields and recorded as the number per square centimetre, using a conversion factor calculated as 3.8. As the colony counts in the petri dishes were made for the whole area of the dish and the period of exposure for each dish was only ten minutes, it is necessary to use the conversion factors of 2.3 and 0.43 respectively to make comparable totals. However, even with such calculations the figures are not strictly comparable because one cannot assume that spores are present in the air in unvarying amounts throughout the day. In fact, our experience has shown that there is considerable variation, hence we have not attempted, in this report, to make such calculated comparisons.

3. *Rotating stands.*—Because of the experience of the Dominion Rust Research Laboratories in their atmospheric studies of rust spores, we adopted, as an additional method of study, the rotating stand. Coated slides were mounted vertically on a rotating stand which turned freely in such a manner that the coated surface of the slide was always facing into the air current.

SUMMARY OF DATA BY CULTURE METHOD

Colonies of fungi were obtained throughout the year with the exception of a few days in the winter months. The lowest counts were in November, December and January. High counts

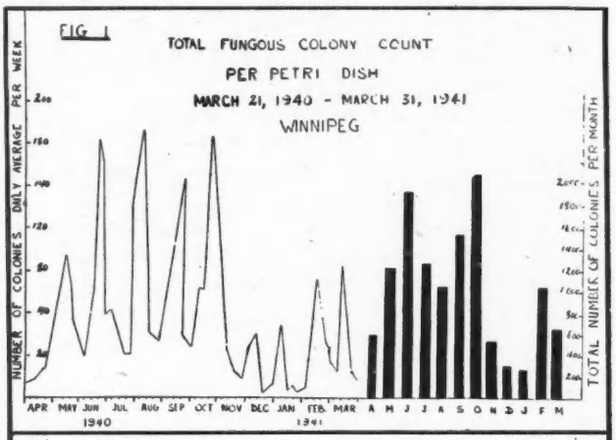


FIG 1
TOTAL FUNGOUS COLONY COUNT
PER PETRI DISH
MARCH 21, 1940 - MARCH 31, 1941
WINNIPEG
NUMBER OF COLONIES DAILY AVERAGE PER WEEK
TOTAL NUMBER OF COLONIES PER MONTH
APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR A M J J A S O N D J F M
1940
1941

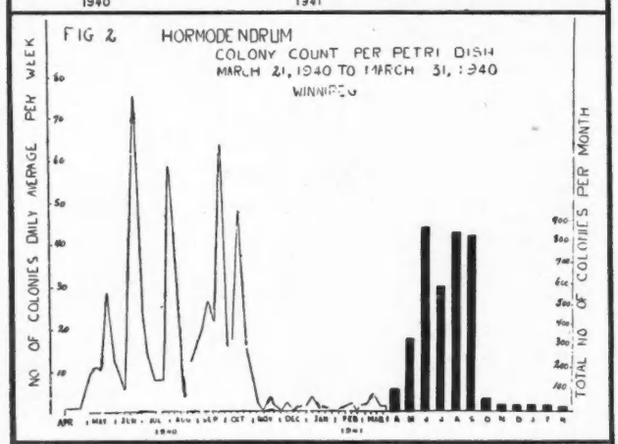


FIG 2
HORMODENDRUM
COLONY COUNT PER PETRI DISH
MARCH 21, 1940 TO MARCH 31, 1940
WINNIPEG
NO OF COLONIES DAILY AVERAGE PER WEEK
TOTAL NO OF COLONIES PER MONTH

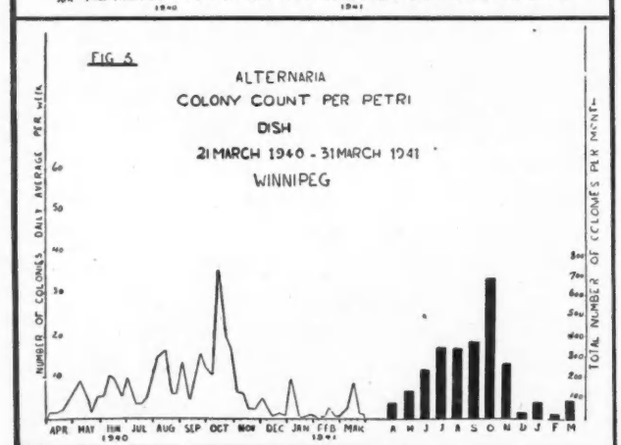
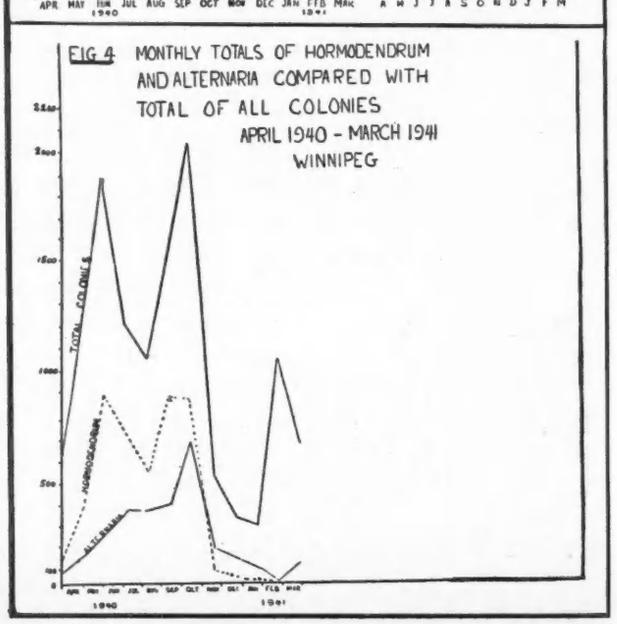


FIG 3
ALTERNARIA
COLONY COUNT PER PETRI
DISH
21 MARCH 1940 - 31 MARCH 1941
WINNIPEG
NUMBER OF COLONIES DAILY AVERAGE PER WEEK
TOTAL NUMBER OF COLONIES PER MONTH
APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR A M J J A S O N D J F M
1940
1941



which occasionally occurred in the winter months were due chiefly to the *Yeasts* and *Monilia* (see Fig. 5) but colonies of all genera occurred sporadically throughout the winter. Total colony counts were notably higher in the warm months (June to October inclusive) due to the greater production of *Alternaria* and *Hormodendrum* spores in that period. They accounted for 25 and 48% respectively of the total count (see Fig. 4). The other identified fungus colonies showed very slight seasonal variation (see Fig. 5 and Table I).

Hormodendrum occurred sporadically throughout the cold months. Large numbers first occurred in May and reached a peak in June. Large numbers continued to be found throughout July and August and increased in September to a peak which persisted throughout October, rapidly subsiding with the cold weather in November.

Alternaria occurred throughout the year and like *Hormodendrum* had its greatest incidence in the warm months. However, it first appeared in notable amounts in March and increased progressively to a peak in October, continuing in fairly large numbers into November.

As mentioned above, *Alternaria* and *Hormodendrum* together constituted 73% of the total colonies found in the warm months. *Yeast* and *Monilia* accounted for the relatively large count in the winter.

The number of colonies, per month, of all identified fungi is recorded in Table I. The proportion of unidentified colonies tended to increase when the total count was high (*e.g.*, June) because of rapid overgrowth after the preliminary count was made.

SUMMARY OF DATA BY SLIDE METHOD

Spore counts were made from coated slides, as described above. These were exposed in Winnipeg for the six years, 1939 to 1944 inclusive. Spores were found so rarely on slides exposed in December, 1940, and January, February and March, 1941, that slides were not exposed during these months in subsequent years. The totals graphically recorded in Figs. 6, 7, 8 and 9, are, in each case, the average of the totals obtained from the stationary and rotating slides. As will be seen in Figs. 10 and 11, these results differed so markedly from one another that it was considered an average would give a truer picture of the atmospheric spore population.

The air content of smut and rust spores can be determined by the slide method only. These

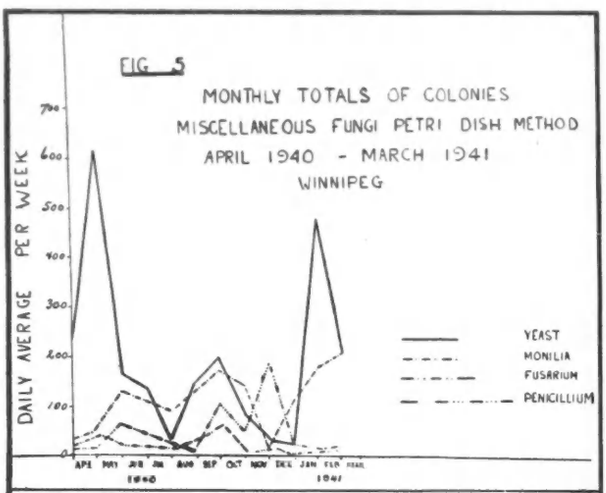
TABLE I.

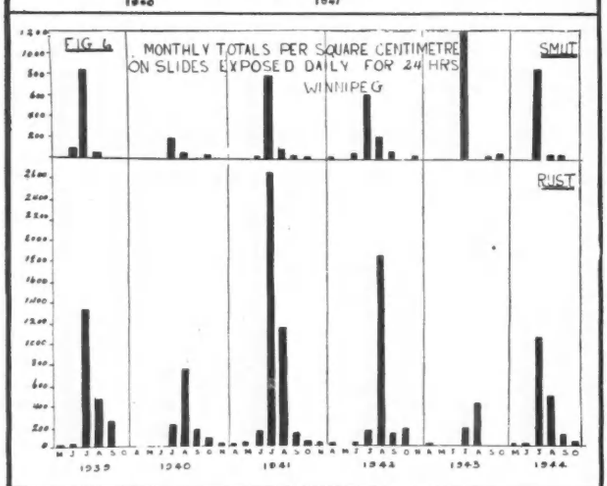
TOTAL COLONY COUNTS BY GENERA, PETRI DISH METHOD

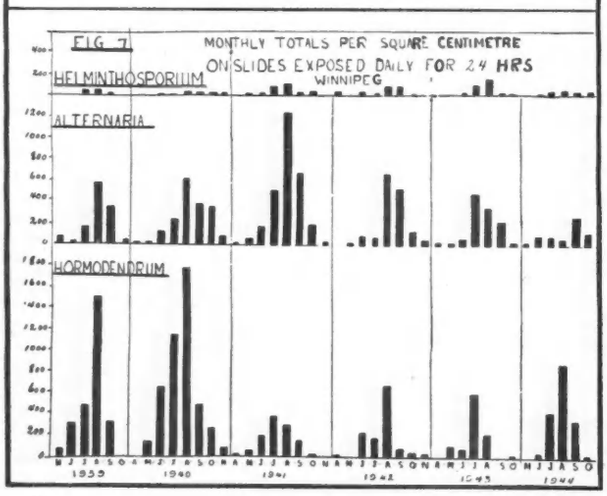
WINNIPEG

1940	*Hormodendrum*	*Alternaria*	*Helminthosporium*	*Fusarium*	*Penicillium*	*Aspergillus*	*Mucor*	*Rhizopus*	*Yeast*	*Monilia*	*Trichoderma*	*Phoma*	*Miscellaneous*	*Unknown*	*Total*
April.....	108	66	2	26	17	2	2	5	233	37			Cephalosporium. 5 Verticellatum.... 2 Ooidium..... 2	37	544
May.....	368	130	4	37	17	6	2	2	618	50	10	2	Stenophyllum.... 2	52	1,300
June.....	902	230		23	58		8		163	127	25			369	1,905
July.....	608	345	5	17	36	5		2	139	110			Stenophyllum.... 2	26	1,295
August...	529	341	7	9	22				24	88				15	1,035
Sept.....	886	362		18	9		5		147	136	5			80	1,648
October..	867	684	2	60	103		5		198	167	14		Verticellatum.... 2	50	2,152
Nov.....	55	172		3	32	5	3		81	132	11	3	Actinomycetes...10	24	531
Dec.....	29	32		7	186	10	3	3	24	10	8	5	Cephalothecium.. 2	8	327
1941															
January..	33	81			18	7	2		18	104	2	5	Myxomycetes.... 2	16	288
February.	25	25	3	8					481	172		22	Actinomycetes... 3 Ooidium.....210	67	1,016
March...	27	95		11	14	5	2		190	194	12	14	Volutella..... 2 Ooidium..... 7 Actinomycetes.... 2	65	640
Total....	4,437	2,563	23	219	512	40	32	12	2,316	1,327	97	51	253	809	12,681

fungi are truly parasitic and do not grow except on their living host. Most other air-borne fungi can be cultured artificially. It will be noted in Fig. 6 that smut spores occur in significant numbers in July only. Rust spores occur in important amounts in July and August only. The peak of rust spore production varies from July to August according to the seasonal variations of the particular year. Further, the amounts of smut and rust spores vary greatly from year to year. It should be pointed out that the air content of rust and smut spores would be greatly increased in the vicinity of harvest operations, as noted by Cadham,[1] but the Winnipeg data, as recorded, probably do not reflect such a condition. A study of grain elevator dust shows a large number of rust and smut spores throughout the year and obviously people exposed to such dust may, if sensitive, have perennial symptoms, in contrast to the strictly seasonal symptoms of others. It will be noted (Fig. 11) that rust spores occur in larger amounts on the rotating stand than on the stationary stand. This is in line with observations of the Dominion Rust Laboratory.







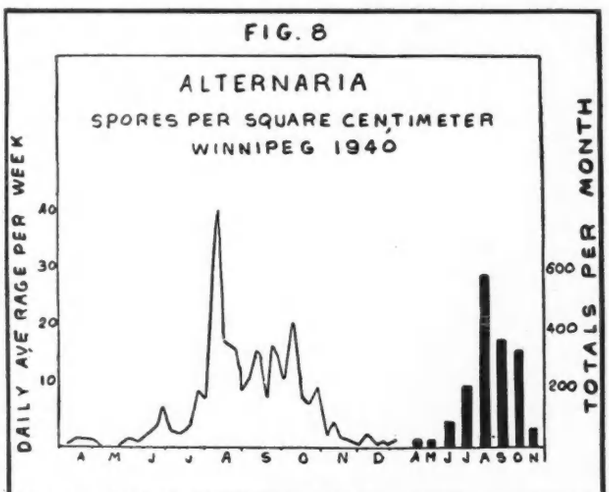


FIG. 8
ALTERNARIA
SPORES PER SQUARE CENTIMETER
WINNIPEG 1940
DAILY AVERAGE PER WEEK
TOTALS PER MONTH
A M J J A S O N D A M J J A S O N

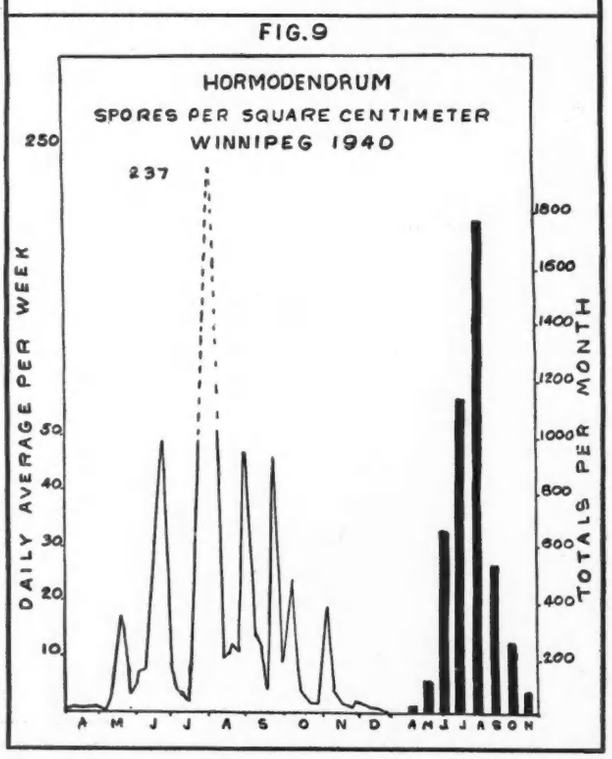


FIG.9
HORMODENDRUM
SPORES PER SQUARE CENTIMETER
WINNIPEG 1940
237
DAILY AVERAGE PER WEEK
TOTALS PER MONTH
A M J J A S O N D A M J J A S O N

The only other spores readily identifiable in any quantity on slides are those of *Hormodendrum*, *Alternaria* and *Helminthosporium*. It will be noted in Fig. 7 that there is a considerable variation in their spore counts from year to year. Although occasional spores of these genera are found throughout the year, they occur in significant numbers in June, July, August, September and October only. *Helminthosporium* occurs in such small numbers that it is probably of very little practical importance.

TABLE II.

TOTAL MONTHLY SPORE COUNT PER SQUARE CENTIMETRE (AVERAGE OF STATIONARY AND ROTATING SLIDES) WINNIPEG

	Alternaria						
	1939	*1940*	*1941*	*1942*	*1943*	*1944*	*Av.*
Jan.			13				
Feb.			0				
Mar.			6				
April.		11	4	10	12	0	7
May.	68	8	49	16	15	11	28
June.	26	110	168	77	64	84	88
July.	159	231	507	64	475	82	253
Aug.	579	624	1,250	752	358	74	606
Sept.	344	390	639	527	224	273	399
Oct.	45	352	183	137	16	111	140
Nov.		64	25	43			44
Dec.		30	14	4			16
Total.	1,221	1,820	2,858	1,630	1,164	635	..

	Hormodendrum						
	1939	*1940*	*1941*	*1942*	*1943*	*1944*	*Av.*
Jan.			0				
Feb.			6				
Mar.			17				
April.		11	25	18	0	0	10
May.	95	132	57	0	93	0	63
June.	303	662	197	219	62	40	247
July.	481	1,139	371	174	596	421	530
Aug.	1,506	1,775	299	686	211	873	891
Sept.	329	537	161	77	0	326	238
Oct.	0	276	17	33	12	14	58
Nov.		95	12	36			48
Dec.		4	0	0			1
Total.	2,714	4,631	1,162	1,243	974	1,674	..

	Helminthosporium						
	1939	*1940*	*1941*	*1942*	*1943*	*1944*	*Av.*
Jan.			0				
Feb.			2				
Mar.			0				
April.		0	0	8	0	2	3
May.	0	0	4	4	2	0	1
June.	0	4	12	14	6	6	7
July.	38	4	87	4	87	42	43
Aug.	38	45	102	86	154	51	79
Sept.	4	15	25	77	26	34	30
Oct.	0	8	26	4	0	40	13
Nov.		4	0	2			2
Dec.		4	8	0			4
Total.	80	84	264	199	275	175	..

Fig. 8 is made from data compiled from slide examinations and is comparable to Fig. 3, made from culture data. To compare plate counts with slide counts the former should be multiplied by 2.3 (*vide supra*). It will be observed that there are some notable differences in the data from the two methods. The peak production of *Alternaria* was found in the slides early in August, but by culture methods it occurred in October. The slides showed the first significant amount of *Alternaria* spores in June, whereas the culture plates showed significant amounts early in May and late in April.

Slide counts of *Hormodendrum* shown in Fig. 9 are comparable with plate counts in Fig. 2. Here again are notable differences, although not as marked as in the case of *Alternaria*. It is difficult to account for these differences, but they emphasize the probable greater value and accuracy of the culture method of study for these particular fungi.

Tables II and III are simply monthly summaries of the slide data (averaged as explained above). The most significant features are shown

TABLE III.

TOTAL MONTHLY SPORE COUNT PER SQUARE CENTIMETRE (AVERAGE) OF STATIONARY AND ROTATING SLIDES WINNIPEG

	Rust						
	1939	*1940*	*1941*	*1942*	*1943*	*1944*	*Av.*
Jan.			4				
Feb.			6				
Mar.			0				
April.		11	2	4	2	0	4
May.	19	0	34	0	0	2	11
June.	15	0	148	24	0	8	32
July.	1,328	197	2,656	132	155	1,057	920
Aug.	466	738	1,145	1,830	396	485	843
Sept.	242	155	116	134	10	131	131
Oct.	0	76	32	162	0	34	50
Nov.		4	2	0			2
Dec.		4	6	0			3
Total.	2,070	1,185	4,151	2,286	563	1,717	..

	Smut						
	1939	*1940*	*1941*	*1942*	*1943*	*1944*	*Av.*
Jan.			0				
Feb.			0				
Mar.			0				
April.		0	0	2	0	0	
May.	0	0	0	0	0	0	
June.	87	0	4	53	0	0	24
July.	837	185	795	628	1,248	856	758
Aug.	30	38	70	196	0	19	59
Sept.	0	0	19	61	8	25	19
Oct.	0	34	2	0	34	0	12
Nov.		0	0	6			2
Dec.		0	0	0			
Total.	954	257	890	946	1,290	900	..

graphically in Figs. 6, 7, 8 and 9. The six year averages show that the peak production of *Alternaria, Hormodendrum* and *Helminthosporium*, as seen on the slides, occurs in August. The peak production of smut occurs always in July while the rust peak extends through July and August. These tables again emphasize the great yearly variation and the necessity of a study over several years.

FIG. 10

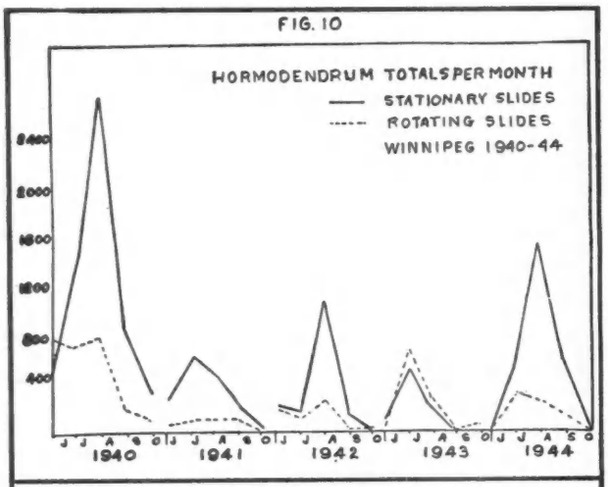
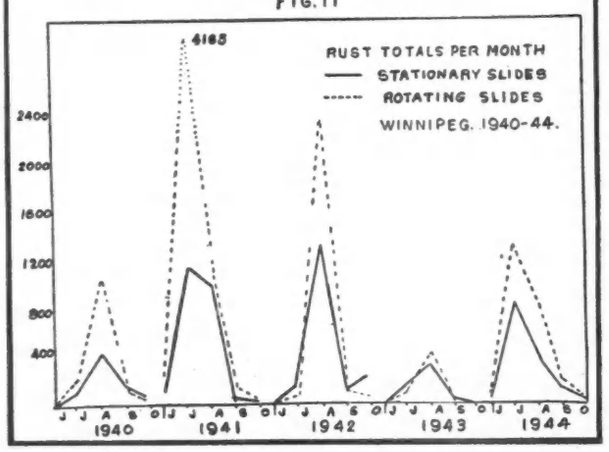


FIG. 11



Figs. 10 and 11 have been prepared to show the striking differences in counts obtained by the stationary slides and the rotating slides. *Hormodendrum, Alternaria* and *Helminthosporium* were all found in larger amounts on the stationary slides. In contrast with this, rust and smut spores were found in greater numbers on the rotating slides. There appears to be no satisfactory explanation for this consistent phenomenon as observed over five years, but it emphasizes the necessity of using the two methods of observation.

SUMMARY OF WINNIPEG OBSERVATIONS

1. The air in Winnipeg, over a period of six years, has been shown to contain significant amounts of the spores of rust, smut, *Alternaria, Hormodendrum, Yeast* and *Monilia;* also smaller numbers of other genera including *Helminthosporium, Penicillium, Rhizopus, Mucor, Aspergillus, Fusarium, Phoma* and *Trichoderma.* These results are of a similar order to those reported and published by Feinberg in Chicago.[2]

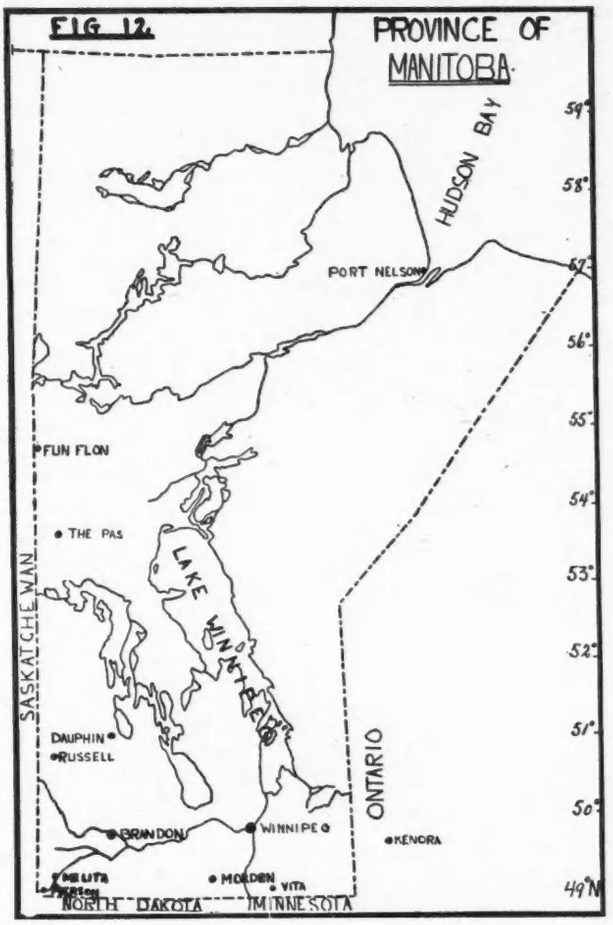
2. Three methods of study were used and it appears that all three methods are necessary to acquire a maximal amount of information. Spores such as rust and smut cannot be studied by the culture method. *Alternaria, Hormodendrum,* and *Helminthosporium* can be studied by both methods, but our results indicate that the culture method is more accurate for these genera. Certain fungi can only be studied satisfactorily by the culture method, *e.g., Aspergillus, Mucor, Rhizopus, Penicillium, Yeast* and *Monilia.* Two slide methods were used and it was shown that the rotating slide proved to be more useful for *Alternaria, Hormodendrum* and *Helminthosporium.*

3. A definite seasonal incidence was demonstrated for *Alternaria, Hormodendrum* and *Helminthosporium.* Although these fungi occurred sporadically throughout the year, rust and smut occurred only in the mid-summer months. The other genera which were identified had a less well-marked season, although they tended to be more prevalent during the warm months.

4. Marked variation in quantity was noted from year to year, but the seasonal pattern remained essentially the same.

5. The seasonal pattern, referred to above, is probably of considerable importance. Patients sensitive to atmospheric spores may be expected to have symptoms starting in late April, increasing to a peak in July and persisting through successive peaks up to late October. Symptoms may extend in some cases into November. This may be contrasted with seasonal pollinosis. The authors showed[3] that the main pollen seasons in this region were as follows: tree pollination, occurring from the last week of April into the first week of June; grass pollination, from the fifteenth of June to a peak in July; weed pollination, starting late in July and ending in mid-September.

6. If sensitivity to one of the non-seasonal fungi occurs, obviously there would be no seasonal variation of symptoms.



STUDIES OUTSIDE WINNIPEG

It was not possible to carry out culture studies at stations outside of Winnipeg but slide studies were made at various places shown on the accompanying map of Manitoba (Fig. 12). Suitably coated slides were prepared in Winnipeg and sent out to the various stations, where they were exposed daily for 24 hours and then returned to

TABLE IV.

STEVENSON FIELD, WINNIPEG AIRPORT, 1939
STATIONARY STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	0	4	0	0	0	4
May..	15	23	1,133	0	0	1,171
June..	19	23	352	8	0	392
July..	958	98	1,241	11	204	2,512
Aug...	231	250	2,120	23	0	2,624
Sept..	307	178	151	15	0	651
Total.	1,530	576	4,997	57	204	7,364

STEVENSON FIELD, WINNIPEG AIRPORT, 1940
ROTATING STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	0	0	8	0	0	8
May..	0	23	174	0	0	197
June..	26	79	1,364	11	0	1,480
July..	329	303	2,271	38	167	3,108
Aug...	1,487	1,200	1,938	87	0	4,712
Sept..	91	488	783	49	0	1,411
Total.	1,933	2,093	6,538	185	167	10,916

TABLE V.

KENORA, ONTARIO, AIRPORT

1939, Stationary Stand	*April*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Jan.*	*Feb.*	*Mar.*	*Total*
Rust	0	0	4	163	110	170	..	..	..	..	..	..	447
Alternaria	4	8	0	53	170	68	..	..	..	..	..	..	303
Hormodendrum	0	15	30	38	435	276	..	..	..	..	..	..	796
Helminthosporium	0	0	0	11	8	8	..	..	..	..	..	..	27
Smut	19	0	0	61	0	0	..	..	..	..	..	..	80
Total	23	23	34	326	723	522	..	..	..	..	..	..	1,651
1940, Rotating Stand													
Rust	11	8	79	98	136	83	72	8	4	8	4	0	507
Alternaria	8	0	30	61	178	624	307	95	11	11	15	15	1,325
Hormodendrum	0	4	136	148	1,365	500	405	83	30	8	8	8	2,680
Helminthosporium	4	0	19	4	42	0	11	4	0	0	0	0	88
Smut	0	0	61	98	0	0	0	0	0	0	0	0	159
Total	23	12	310	424	1,684	1,259	784	197	49	27	27	23	4,759
1941, Rotating Stand													
Rust	0	227	787	856	280	121	38	8	0	..	..	..	2,317
Alternaria	0	30	659	261	561	424	114	11	49	..	..	..	2,112
Hormodendrum	8	114	201	273	394	151	167	0	8	..	..	..	1,316
Helminthosporium	0	4	15	38	15	15	0	0	4	..	..	..	91
Smut	0	0	76	280	76	265	0	0	0	..	..	..	697
Total	8	375	1,738	1,708	1,329	976	319	19	61	..	..	..	6,533

Winnipeg for examination and study. The slides were exposed in Stevenson shelters at meteorological stations at all points except Brandon and Vita. In the former they were exposed on the roof of the Clement Block, and at Vita at a private residence. When rotating stands were used they were mounted on five foot posts in exposed places.

The tables (IV to XIV) record the data obtained.

TABLE VI.

BRANDON, 1939, EXPERIMENTAL FARM STATIONARY STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	4	4	0	0	0	8
May..	11	42	1,563	4	0	1,620
June..	19	83	1,854	15	87	2,058
July..	299	140	651	30	1,045	2,165
Aug...	768	821	1,662	57	15	3,333
Sept..	382	295	420	4	30	1,131
Total.	1,493	1,385	6,150	110	1,177	10,315

BRANDON, 1940, EXPERIMENTAL FARM STATIONARY STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	0	4	15	0	0	19
May..	8	19	53	0	0	80
June..	4	53	201	0	0	258
July..	26	57	443	8	30	564
Aug...	685	428	1,003	45	0	2,161
Sept..	333	307	159	26	0	825
Total.	1,056	868	1,874	79	30	3,907

TABLE VII.

BRANDON, CLEMENT BLOCK, 1940, ROTATING STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	0	4	15	0	0	19
May..	0	11	144	0	0	155
June..	15	45	352	4	0	416
July..	212	231	704	23	0	1,170
Aug...	952	348	337	15	0	1,652
Sept..	98	390	53	26	23	590
Oct...	..	..	..	..	..	..
Total.	1,277	1,029	1,605	68	23	4,002

BRANDON, CLEMENT BLOCK, 1941, ROTATING STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	0	15	8	0	0	23
May..	19	98	95	8	0	220
June..	19	102	61	8	0	190
July..	446	488	390	30	340	1,694
Aug...	1,510	1,734	435	291	83	4,053
Sept..	197	579	356	34	0	1,166
Oct...	38	155	114	19	0	326
Total.	2,229	3,171	1,459	390	423	7,672

TABLE VIII.

VITA, 1940, MAY TO OCTOBER 10, STATIONARY STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
May..	4	72	450	0	0	526
June..	23	390	2,446	19	0	2,878
July..	163	992	1,571	49	170	2,945
Aug...	401	261	507	26	0	1,195
Sept..	79	1,310	2,161	72	91	3,713
Oct...	34	261	780	11	0	1,086
Total.	704	3,286	7,915	177	261	12,343

TABLE IX.

MORDEN, 1939, ROTATING STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	0	0	0	0	0	0
May..	0	68	178	4	0	250
June..	8	132	344	15	1,325	1,824
July..	4,693	242	443	76	4,228	9,682
Aug...	1,817	568	1,294	95	0	3,774
Sept..	651	159	30	15	0	855
Total.	7,169	1,169	2,289	205	5,553	16,385

MORDEN, 1940, ROTATING STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	8	15	30	0	11	64
May..	0	4	91	0	0	95
June..	61	148	814	0	0	1,023
July..	2,226	1,678	4,400	98	2,388	10,790
Aug...	4,164	2,063	636	144	0	7,007
Sept..	409	632	250	64	0	1,355
Total.	6,868	4,540	6,221	306	2,399	20,344

TABLE X.

MELITA (Near Pierson), 1940, ROTATING STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	..	..	..	..	..	..
May..	4	45	337	4	0	390
June..	53	246	568	38	61	966
July..	136	522	3,810	19	825	5,312
Aug...	1,037	833	492	68	0	2,430
Sept..	178	386	340	34	0	938
Total.	1,408	2,032	5,547	163	886	10,036

TABLE XI.

PIERSON, 1939, STATIONARY STAND. In sheltered spot

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	0	4	0	0	0	4
May..	8	4	23	0	0	35
June..	15	132	447	0	0	594
July..	185	291	727	42	246	1,491
Aug...	344	310	700	11	0	1,365
Sept..	492	307	170	8	0	977
Total.	1,044	1,048	2,067	61	246	4,466

TABLE XII.

RUSSELL, 1939, STATIONARY STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	0	0	0	0	0	0
May..	0	4	8	4	0	16
June..	8	8	129	0	0	147
July..	182	114	382	19	0	697
Aug...	791	299	867	23	15	1,995
Sept..	477	231	1,853	19	0	2,580
Total.	1,448	656	3,239	65	15	5,423

RUSSELL, 1940, STATIONARY STAND

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	4	8	19	4	0	35
May..	0	11	238	4	0	253
June..	19	159	1,688	4	61	1,870
July..	23	201	1,328	53	203	1,666
Aug...	431	481	1,359	87	53	2,661
Sept..	333	579	1,597	30	0	2,592
Total.	810	1,439	6,229	182	417	9,077

TABLE XIII.

DAUPHIN, 1939, STATIONARY

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	23	4	0	0	0	27
May..	8	19	34	0	0	61
June..	8	26	121	0	0	155
July..	87	91	310	0	250	738
Aug...	340	291	814	19	0	1,464
Sept..	182	223	647	11	0	1,063
Total.	648	654	1,926	30	250	3,508

TABLE XIV.

THE PAS, 1939, STATIONARY

	Rust	*Alternaria*	*Hormodendrum*	*Helminthosporium*	*Smut*	*Total*
April..	0	0	23	0	0	23
May..	0	0	0	0	0	0
June..	45	8	420	0	0	473
July..	575	34	174	0	8	791
Aug...	337	87	322	4	87	837
Sept..	382	79	61	0	0	522
Total.	1,339	208	1,000	4	95	2,646

SUMMARY OF DATA FROM POINTS OUTSIDE WINNIPEG

1. Atmospheric spore counts throughout the province vary widely in amount but follow the same seasonal pattern noted in Winnipeg.

2. Variation of spore counts is to be expected because of the great variation in the local environment of each exposed slide. Winnipeg and Brandon slides were exposed on the top of three storey buildings and therefore would probably not be affected seriously by strictly local conditions. The other slides were exposed quite near to the ground at the meteorological stations. In this connection it is interesting to compare the *Hormodendrum* counts for August, 1940, at Brandon, with those obtained from the Brandon Experimental Farm, but a few miles away.

3. All these data, while incomplete, indicate that the population of air-borne spores is similar in type throughout Manitoba but varies in amount.

4. Total spore counts in the more northerly areas of the province were notably lower than those found in Winnipeg whereas those in the more southerly stations tended to be higher than the Winnipeg totals.

5. These observations suggest that, for all practical purposes, a study of the spore population in the air at Winnipeg reflects conditions prevailing generally throughout the province. However it is obvious that for any particular locality the spore population would vary widely with local conditions.

CONCLUSION

We have seen a number of patients who are undoubtedly spore-sensitive. Experience elsewhere indicates that these cases are common. Our spore counts are very similar in amount and season to those reported from the American mid-west where many cases occur and it is reasonable to suppose that we shall find many such cases here.

Our study indicates that we should consider the following as clinically important in Manitoba: *Alternaria, Hormodendrum, Yeast, Monilia,* rusts and smuts. They should always be considered in the history, the skin tests and in treatment of inhalant allergies. The other fungi noted did not occur in significant amounts in the atmosphere to be clinically important, but it is necessary to remember them, as doubtless they will be found in houses, basements, vegetable, grain and seed store houses, and greenhouses.

We desire to record our indebtedness to the National Research Council of Canada for financial aid in initiating this work; to the Meteorological Service of Canada for active assistance in exposing and forwarding slides and particularly to the several local meteorological observers for their courtesy and co-operation; to the Dominion Rust Research Laboratory, Winnipeg, for their courteous and valuable aid; to the Departments of Anatomy and Pathology and to Professor H. J. Brodie of the Department of Botany, University of Manitoba, for much helpful assistance, and to the various members of the medical profession and the many other individuals who aided and encouraged us but whom it is impossible to name.

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St. Mary's and Vaughan Sts.

PSYCHIATRY IN INDUSTRY

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INDUSTRIAL psychiatry is a new but rapidly growing field. While new it is, none the less, an expression of a trend which has been assuming increasing proportions in medicine for a number of decades. This trend consists in the mounting emphasis laid upon the human factor, in illness, in therapy and in prevention. Since the most active part of the individual's day is spent at work, and since many of his major satisfactions and frustrations are met there, psychiatry has begun to find in industry an increasingly important field for work.

There is nothing remarkable in the fact that industrial psychiatry should be growing rapidly. It is a natural sequel to the establishment and expansion of industrial medicine. Just as the medical school, the general hospital and the medical services of the armed forces have found that psychiatry must be incorporated, and prominently incorporated, in their work in order that the modern attack on medical problems may be carried through to success, it is being found that psychiatry must also be brought into the industrial medical team.

It is already possible to discern three main fields in which the industrial psychiatrist is beginning to work and to make definite contributions.

These are teaching, clinical practice and research. It is hard to say which of these is the more fruitful. During the last two years we have had in this area considerable experience in teaching in the broad sense, or perhaps I might better say in transmitting information concerning the behaviour of people at work. A series of lectures has been given in the last two years,* first to large groups which selected themselves primarily upon the basis of their interest in human problems arising in industry and then, later, to groups of foremen and of managerial personnel.

The material presented to the first group consisted very simply in the basic facts concerning human behaviour, how incentives work, what causes fatigue, the range of the emotional reactions. It is amazing how frequently one finds the belief that anxiety is something that the other fellow has, it is not the right thing for you yourself to have; to have it is to be "yellow". Likewise the fact that anxiety may cause a stomach upset or tachycardia is still news to more people than not.

The simple facts of monotony and repetition and their relation to tension have to be handed over, and until we can get the fundamentals of human behaviour taught in the schools with at least the same emphasis as the dates of the battle of Hastings and the signing of the Magna Carta, it will be necessary to go on teaching adults why they act as they do.

We have found these discussions of basic facts very valuable and are planning to expand them. As proof of their general value may be instanced the fact that to explain to men the meaning of the reactions to fear, the way in which groups take form and leadership appears, the effects of frustration and of long continued insecurity, has in the armed forces been of clear value in protecting those men against psychological damage.

While such fundamental information is needed at all levels in the industrial organization, each level has a special series of problems for which special information is of value. Last year we found a remarkably large response to a series of lectures given to foremen and managerial personnel on supervision. Among the matters dealt with were the causes of complaints, not merely the obvious and understandable complaints arising from long hours and inadequate pay, but those which arise just as certainly but less obviously from repetitious work, from psychological difficulties which actually have their true origin quite outside the industry, perhaps in the individual's earlier life, perhaps in rows with his wife or resentments against his parents.

During such discussions a fact which should actually be self-evident must be brought out, namely that any job analysis which is limited to speed, number of repetitions, degree of co-

*See recent series of lectures published in this *Journal* in 1944.

ordination, range of movement, amount of lifting, temperature and humidity, is indeed limited. To be a thorough-going analysis it must include the data as to whether the job can give satisfaction to the worker and to what kind of worker, whether it can give him an outlet for self-expression. We have still to learn that you cannot break down a process into separate "operations" on the basis of what is suitable for the machines and assume that the breakdown will also be suitable for the worker. We have still to add to our mechanical and physiological analysis a psychological evaluation.

In this transfer of information it is clear that among the groups to whom transfer must be made are the industrial physicians and surgeons and the industrial nurses. Up to this point we have been talking exclusively of the transmitting of information as a means of preventing difficulties. Simply put, the more a man knows about himself and his fellows, the less likely it is that frictions and frustrations will occur. The more that those who are in supervisory and managerial positions know about human behaviour—its motivations and aggressions—the better job will they be able to do.

Once signs of wear and tear, of decreased effectiveness or actual breakdown have occurred it is necessary to turn to different groups, namely to the medical and nursing personnel.

Let me state the most important fact first and very simply. The vast amount of mental ill health and incipient behavioral breakdown is not recognized for what it is. You will notice that I have used, where possible, alternative phrases in place of mental breakdown and mental diseases. The reason is that there is still far too great a tendency to think of the major disorganizations as being the only representatives of psychological breakdown. Implicit in far too many minds is the assumption that man has either got dementia præcox or there is nothing wrong with him of a psychiatric nature.

The reason for this curious situation is to be found in the medical school teaching of two or three decades ago. At that time, if the student was given any instruction at all concerning human behaviour, that instruction was given by men whose professional appointments were in the mental hospitals where they encountered, for the most part, the exceptional cases of breakdown, the end results, and those patients who were so acutely disordered that they could not be managed outside a protected environment.

Now we are aware that the man going out into practice will encounter one or two instances a year at the most of people suffering from breakdowns of this acute or extensive nature, but that every day he will come across instances where psychological factors are playing an important and often a decisive part in the man's illness, and, as we move progressively towards an actively preventive medicine and towards social medicine, a live knowledge of human behaviour will become a very necessary part of the equipment of all physicians.

In industry we are now in the process of identifying those occupations which constitute the greatest psychological hazards to the worker or perhaps we should say that we are in the process of identifying the particular kinds of jobs which are most hazardous for particular kinds of persons. For, when we are considering infectious diseases, it is the kind of micro-organism that is of primary importance; the kind of person who is attacked is only of secondary significance for us when we plan prevention and cure. But when we set about similar planning concerning behavioral breakdowns we have to concern ourselves equally with the situation and with the person.

We can already identify certain trades which are dangerous to certain people. For almost all people, but more particularly for the tense individual who finds it hard to relax quickly and adequately between periods of pressure, those occupations which call for sustained utilization of a limited part of their equipment are apt to be harmful; the thousand times repeated inspection of one small part, the endless repetition of one limited operation, for instance one woman pasted a strip of paper on 18,000 paper bags every day.

Today we recognize that if we overload the man who is excessively set upon doing his job well, who cannot be content unless it is just so, we shall find that he begins to develop tension and anxiety, will lose confidence and concentration and will eventually have to stay off work. One thinks here of the senior bank clerk who did an outstandingly precise and reliable job when he had to take responsibility for his own work and that of a few efficient subordinates. When those workers were drafted and he had to take on responsibility for larger and larger numbers of inexperienced youngsters he came

under progressively greater strain. He could not relax his standards; to have done so would have, in itself, created anxiety. Accordingly he worked longer and longer hours and kept himself under continually rising pressure in a vain attempt to check and supervise everything, with the result that he ultimately broke down into an anxiety state and at the end of two years was still unable to return to work.

Finally, though this is more difficult, we are beginning to recognize that it is hazardous in the industrial medical sense for certain types of personality to work with certain others. It is more difficult because it requires two separate personality evaluations. The simplest example of this is the situation where the subordinate is an insecure, unconfident person whose difficulties stem from a tyrannical father or domineering mother, and where the boss is an assertive, sadistic individual. During the last two years we have had occasion to see several instances of this and in each case the subordinate who happened to be a well trained and technically competent person became so disturbed that his services were lost to his organization.

This represents only part of the information which the industrial medical man must have. I have not stressed what I shall now refer to briefly, since this latter is knowledge required of all those in the practice of medicine, namely a proper recognition of the psychosomatic nature of illness. The last ten years have seen remarkable strides in this direction. Few would now try to evaluate complaints referred to the gastrointestinal tract or to assess tachycardia or precordial symptoms without raising the question in their own minds as to how far psychological factors may be contributing to the picture which the man presents. The manifestations of emotional tension are so protean, so widespread, that it is still difficult, even for those of us who are continually at work in this field, to recognize their full range.

For not only do we find tension manifesting itself in such hitherto unsuspected forms as blurring of vision, tinnitus, dizziness, postural kyphosis, and itching of the skin, but we find it playing a supporting rôle in a considerable number of other instances. In a recent joint symposium with the Section of Dermatology, it was the dermatologists who pointed out that ringworm was a more difficult problem in the tense anxious person whose hands and feet were continually wet and cold, it was they who pointed out that both eczema and psoriasis, whatever their essential cause, tend to get worse during periods of stress and better when the patient is more at ease.

At this juncture I should like to make the point that it is exceedingly important that the industrial physician should be well oriented in regard to this rapidly evolving field of psychosomatic medicine. It is a truism, but one that will bear repeating, that the vastly greater part of the practice of psychiatry is not going to be, and cannot be, carried out by psychiatrists. It must be carried out by everyone who is engaged in the practice of medicine. You will readily see that by far the greater amount of bacteriology—the application of bacteriological principles and at least of the simpler techniques—is carried out by those who are not bacteriologists. These principles and techniques are carried out by surgeons, by physicians, by obstetricians and, indeed, in their simplest, but by no means least important forms, by housewives who insist on pasteurized milk, by the owners of provision stores who screen their products against contamination by flies, by anyone who cleans a cut and applies an antiseptic to a scratch. It is in this same sense that knowledge concerning human nature must be incorporated into the procedures of every medical man and, indeed, into the common dealings of people with each other.

What are the special clinical contributions which psychiatrists can make within industry? First he should form part of the medical team examining all new employees. As is well known, this was done with great benefit in the induction of men into the army, both in Canada and in the United States. Of all the methods of estimating the stability of the individual the interview remains the most effective. During it the quite infrequent individual suffering from one of the major breakdowns can be discovered. Of far greater importance is the opportunity which it affords to identify the very large number of individuals who suffer from inadequate mental health or from recurrent psychosomatic illness. Their identification should, by no means, entail their automatic rejection. In the majority of instances they will be found capable of reasonable working efficiency but it is of importance that they should be known to the medical and personnel departments and that their capacities should also be a matter of record.

Finally the industrial psychiatrist familiar with actual breakdowns is also familiar, from his study of the development of the early stages of these breakdowns, with the personality traits which render such a person prone to experience difficulties under given situations. As stated earlier he knows that the over-conscientious, precise and rigid person does not do so well in jobs which result in his being pushed beyond his usual tempo of work. By recognizing the existence of such personality traits during the medical examination he can assist, through recommendations as to placement, and thus serve to prevent subsequent breakdowns.

I shall not spend time in discussing the obvious place of the industrial psychiatrist in dealing with referrals and with those requesting interviews. This involves a range of problems as wide as human difficulties themselves. Among them, however, two groups assume major proportions due to characteristics fundamental to the nature of industrial life. The first group is comprised of those who suffer from tension and anxiety due to the current widespread existence of rapid repetitious jobs, the hall marks, as it were, of mechanization and also to the equally widespread existence of jobs stripped of psychological satisfaction in the process of breaking a procedure down into a series of operations fitted to the needs of the available mechanical processes rather than to the needs of the worker. The second major group of those requiring assistance is comprised of men and women who find difficulty in managing personal relations at work, relations which differ in many important aspects from those found in the home and those which the individual usually maintains with his friends and acquaintances.

Finally, a large and exceedingly important field for work is opening up for the industrial psychiatrist in research. A great deal of work requires to be done on problems of selection. The knowledge and technique of many different kinds of personnel are required for successful work in this field. The experience of the psychiatrist and the methods which he has worked out for evaluating human personality are of the greatest value.

It is not too much to say that adequate selection and placement will go far, not only in increasing effectiveness but in cutting down the widespread mental ill health which exists. A second problem which can serve to illustrate the range of industrial psychiatric research is that of the investigation of psychologically hazardous occupations and the study of situations in which an unusually high degree of maladjustment and mental ill health develops. We are all familiar with the fact that a certain department or a given office may become outstanding because of the amount of interpersonal friction, because of the amount of absenteeism, psychosomatic illness, of poor morale which develops among the personnel who work in it. We already know in a rather superficial way some of the causes—inadequate supervision, unduly large numbers of poorly adjusted persons in the group, frustrating work conditions—but there are undoubtedly many more which await identification and remedy.

Finally I will make reference to that most pervasive and damaging of by-products of speeded-up and mechanized industry, namely tension. Every month men leave industry permanently damaged by exposure to too much tension for too long. Most commonly these men are precisely those which industry most values, conscientious, precise in their work, more than willing to take responsibility. Industry has a major obligation to see that means are worked out to protect these workers against the dangers to which their very virtues expose them.

We have got to learn what kinds of jobs, what kinds of industrial situations produce excessive tension, in what kinds of persons are disabling and destructive levels of tension liable to develop, what are the most effective means of preventing extreme tensional rises or of reducing them once they have appeared.

This constitutes a survey of a field which has had its origin in very recent years, which is rapidly taking form and which, like the new Mexican volcano Paricutin, appears destined for rapid though, let us hope, not explosive growth.

1025 Pine Ave. W.

A physician can sometimes parry the scythe of death, but has no power over the sand in the hour-glass.—Hester Lynch Piozzi.

MEDICAL CARE IN THE COAL MINING AND STEEL INDUSTRIES OF NOVA SCOTIA*

By J. G. B. Lynch, M.D.

Sydney, N.S.

THE honour of having been asked to read a paper at the annual meeting of the Canadian Medical Association is one I accepted because of the subject and, perhaps also, because of the opportunity of suggesting that an investigation of colliery and steel practice by a committee might give the Canadian Medical Association important information as to what will take place if health insurance is established in Canada, and what pitfalls to try to overcome.

In the early 1800's, coal mining was started in Nova Scotia by the General Mining Association of Great Britain and they brought with them, not only their miners, but also their storekeepers, clergymen and medical men.

At this time the miners were paid on two different contracts, a temporary one of four months and a permanent one of one year. In the interim, these men were staked or supplied by the operators with what necessities of life and medical services they thought should be provided. Although there is no authentic information on this point, I believe that deductions were made from the workers, and the medical men were paid on the basis of the check-off. I question if there was more than one medical man giving service at any one colliery, therefore, he alone had complete charge of all the workmen employed and also their families. Later, regulations were changed so that there could be no check-off for any service or supplies, and during this period the medical man must have been paid directly by the men. This did not prove satisfactory and the check-off was re-established, and once more, the men chose their own doctor and paid him on the weekly or monthly basis.

The amount of weekly remuneration paid by the workmen has changed with the time and is not uniform in all localities and collieries, as there are different rates covering diversified services. The medical services given, for a certain amount of money, vary in the different communities. In some places it covers all medical care and medicine required by a workman and his family during the period of necessity, with the exception of a small fee for obstetrics and V. D. In others it does not cover so much. The medical check-off is paid if a man works so many days a week, but if he does not work the specified number, medical care has to be carried on without pay. Through legislation in later years, the medical service check-off was embodied in the Mines Act, the Compensation Act and in a number of others.

As you can readily see, there are specified requirements for a medical man to get on the check-off, one being that he must have a certain proportion of employees at a pit to qualify for recognition. This factor leaves it open to a political and canvassing method of acquiring patients and, in years gone by, has caused considerable discord and perhaps, if there is such a thing as medical ethics, a breakdown of ethical practice. At the present time, I do not think this is in vogue to any great extent, but at one time there were paid canvassers going out for the medical practitioners.

Of necessity, if a man has what is known as a large check-off practice, it is impossible for him to give complete, careful, scientific, medical attention to his clientele, and the twenty-four hour day is not long enough. In such instances, some medical men have found it necessary to pay assistants.

The strenuousness of such an extensive practice does not leave much opportunity or time for postgraduate study, because the man is so exhausted from work that if he has any leisure he usually spends it at a recreation or rest centre to rehabilitate himself to carry on.

The dispensing of drugs is one factor that most colliery doctors dislike very much and I think they would be glad of an opportunity to give it up. If they did so, I believe the type of drugs would be much improved.

Since the early 1900's, hospital facilities have increased materially in the mining districts and today there is no district without a modern, up-to-date hospital, well equipped and well managed. This has been of great service to the men and very helpful to the practitioner.

The annual cost of medical services to miners in Nova Scotia is approximately $266,585.00. The hospital costs are approximately $300,000.00.

I think there is something to be said for this type of contract practice, such as I have described, and very much that can be said against

*Read at the Seventy-sixth Annual Meeting of the Canadian Medical Association, Section of Industrial Medicine, Montreal, June 14, 1945.

it. If the Canadian Medical Association would deem it wise, a competent committee would, I feel, get the full support and much information from the colliery doctors, which would be helpful to them in bringing in suggested changes in the health plan for Canada, and might avoid many of the pitfalls that now exist there, or which have been found in panel practice elsewhere.

The Steel Industries

Medical practice in the steel districts is on a different basis altogether. It is in towns where the check-off does not exist and is run on the consultation and visit fee plan. The general practitioner in the community has his own private practice and has no hold on his patients, nor have the patients any hold on the doctor. The morale and ethical practice in these centres is the same as is found in general practice anywhere.

In Nova Scotia, medical practice, from the industrial standpoint, in these two types of employment is altogether different in respect to Workmen's Compensation. In the colliery districts, the check-off covers full payment for medical aid; in the steel industry the employer covers the total cost for medical aid. In the colliery districts, first aid dressing stations are located at each mine. These are in the charge of first aiders and their efficiency is sometimes questioned. The hygiene, outside of periodic inspections of the washrooms and toilets, is carried on by the engineering department of the industry. That is, as to air conditions, dust hazards, transportation accidents etc., sometimes, the medical consultant of the Company is asked for an opinion. In the steel industry of Nova Scotia, industrial accidents are cared for by a medical and nursing staff, with up-to-date hospital and dressing stations and ambulance service. In cases of sickness or non-employment accidents, patients are sent to the emergency hospital or dressing stations, and are given emergency treatment. Then, the attending physician or family doctor is contacted at once, notified of the provisional diagnosis, medication administered and asked what disposition he wants made of the case. Staff physicians are not allowed to build up practices out of employees; they are consulted at the dressing station or hospital. Results are very good as can be seen from the following statistics:

Compensable Accidents to Workmen Per 10,000 Man Days Worked in 1944

All collieries	7.7
Steel	0.45

Of course there are a certain number of complaints, but who is perfect? I do not think the employer, employee or the medical staff can be like Cæsar's wife, but on the whole this system has proved very satisfactory, both to employer and employee.

Pre-placement medical examinations do not exist in the steel or coal industries of Nova Scotia, but I think both the workman and the employer would benefit very much if they were instituted.

Since this paper was written, the miners have called several meetings to discuss the medical set-up. They think it should be changed, immediately, to a clinic type of practice and that the check-off should go to a committee of miners who would have complete charge of the medical services and pay the medical men on a salary basis. What a political football this would make of medicine, and what a backward step it would be from the scientific standpoint! The ultimate results would be harmful to medical ethics and also, would make the services to the individual very much less complete and beneficial.

109 Charlotte St.

INDICATIONS FOR AND END RESULTS OF THE FENESTRATION OPERATION*

By Honorary Wing Commander Joseph A. Sullivan, M.B.

Consultant Otologist, Royal Canadian Air Force, Toronto

THIS presentation is a critical review of my observations and results of operation in 410 cases of clinical otosclerosis covering a period of seven years. In the fall of 1937 and throughout 1938 I commenced a basic study of this condition. In May, 1938, before the American Oto-

* Read before the Section of Otolaryngology, Canadian Medical Association, Montreal, Canada, Thursday, June 14, 1945. Illustrated by lantern slides and specimens.

From the Otolaryngological service of Dr. J. X. Robert, St. Michael's Hospital, Toronto, and the Department of Otolaryngology, the University of Toronto.

logical Society Lempert[1] had read his initial contribution, namely, "A new one stage surgical technique for improvement in hearing in cases of otosclerosis". In the summer of the same year, 1938, I visited Gronigen, Holland, to hear Sourdille, of Nantes, France, read his paper on the *Surgical Treatment of Otosclerosis* before the European Collegium. Holmgren of Sweden and Nager of Switzerland discussed this paper. Later in Sweden I visited Stockholm and Lund. At the latter University I learned much from the work on labyrinthology being done by Dohlman.[2]

On my return, after discussing all phases of this work freely with Lempert I was afforded an opportunity in the Departments of Otolaryngology and Physiology of the University of Toronto, to carry out experiments on the fenestration technique with monkeys and dogs which had previously been subjected to facial nerve grafting operations. In a prepared discussion of Lempert's paper before the New York Academy of Medicine, March, 1940, I made the following statement:

> "My most favourable results were obtained in cases in which I removed the incus and made the fistula towards the ampulla of the horizontal semi-circular canal, because I was able to mould and place the thinnest part of the tympanomeatal membrane flatly over the fistula. Shortly afterwards there was evolved a modification of the original technique, designated as the 'fenestra nova-ovalis operation'."

Just recently in October, 1944, before the Otosclerotic Committee of the American Academy of Otolaryngology Lempert[3] introduced a further improvement of technique, the mobile cartilaginous stopple, as a means of preventing closure of the fenestra and listed his reasons for doing so as follows:

1. Postoperative serous labyrinthitis with secondary damage to the organ of Corti was prevented by the stopple, which seals the perilymph space and separates it from direct contact with the tympanomeatal flap. Thus postoperative inflammation of the flap was prevented from extending to the endo-lymphatic labyrinth within the perilymph space.

I now ask this question. Is this the reason why Sourdille used a two- and three-stage operations? Possibly yes, but he never gave a rational explanation of these repeated steps.

2. The drop in the hearing for high frequencies which often follows fenestration when the fenestra was kept open did not take place when the fenestra was immediately closed with a stopple. The stopple simulates functionally the normal stapedial foot-plate. It dampens loud air-conducted sound and protects the organ of Corti from acoustic trauma.

3. Lempert claims there are no signs or symptoms of osteogenesis in the newly created fenestra in any of his cases. He quotes a case in which the stopple has been in position for two years. I have used the stopple now in 25 cases from which the following deductions have been drawn. (1) I agree with the principle of the stopple. (2) I do not agree that its use gives the early brilliant results in all cases for practical conversation that the case with the successfully open fenestra does. It may in a few cases but not so universally over a wide range. (3) Therefore, in those cases in which it does not, the following modification is submitted. I advocate the routine use of the stopple but suggest that after an eight-month period when we can feel sure that the attempt at osteogenesis has been defeated the wound should be reopened and the stopple removed, provided, of course, that that particular case has not reached its 30 decibel degree of practical conversational level.

In support of this technical advance I quote from my paper read before this Society in June, 1942,[4] namely: "Every good surgical technique undergoes continual stages of improvement and development. Why should the fenestration procedure be any exception to this fundamental principle of surgery?" It is both unnecessary and irrelevant to enter into detail regarding the surgical procedure. The following are the main points: an endaural incision is invariably used; complete and thorough exenteration of the temporal bone; skeletonization of the basal labyrinthine canal system, removal of the incus, removal of and flattening of the posterior bony canal wall flush with the Fallopian aqueduct; a specially devised plastic reconstruction of the tympanomeatal membranous canal; removal of the head and part of the neck of the malleus with a guillotine; creation of a fistula either in the dome of the vestibule or the ampullated end of the horizontal canal, whichever site is anatomically possible under constant suction; irrigation with magnification provided by means of a dissecting microscope; fitting and wedging into the fenestra of a cartilaginous stopple carefully measured; replacement of the flap over the fenestra and kept in position with the aid of

melted paraffin which is left in position for 8 or 9 days.

Ten years' experience in temporal bone surgery consisting mainly of facial nerve grafting operations and later, the fenestration technique, have taught me that "Jack cannot be master of all trades". This endeavour is an all-or-none principle, and as yet, is far from reaching the stage of simplicity, where it can be done in addition to the routine procedures of the oto-laryngologist. Bitter experience has driven this home. Fundamental principles can be learned and applied but, after that, only painstaking application, coupled with untiring preparation will yield the desired results.

The following analysis of my cases will help to re-emphasize the above mentioned remarks. In order to obtain uniformity in tabulating results the following classification has been requested to be adopted:

1. Complete rehabilitation for social and economic contact as a result of restored hearing was accomplished in 246 cases. In these cases the hearing was improved to the 30 decibel level or higher for the conversational frequencies 512, 1,024, 2,048, and maintained at that level of improvement for at least 12 months postoperatively, allowing only for the normal variable of 5 decibels of audiometric testing.

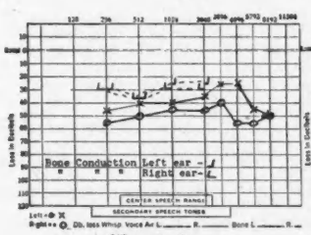


Chart 1.
(March 17, 1939)

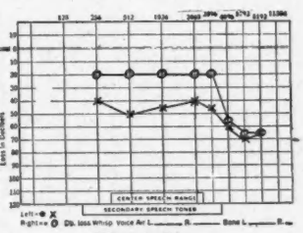


Chart 2.
(May 11, 1945)

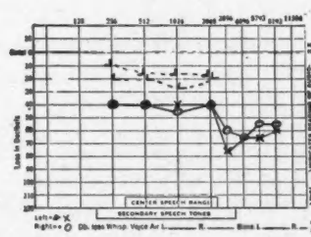


Chart 3.
(February 29, 1944)

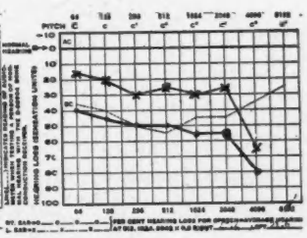


Chart 4.
(May 3, 1945)

2. Partial rehabilitation for social and economic contacts as a result of improved hearing was accomplished in 17 cases. The hearing is improved but the improvement did not reach the practical 30 decibel level in the 512, 1,024, 2,048 frequencies.

3. The hearing was not improved and remained at the preoperative audiometric decibel level in 21 cases.

4. Audiometrically the hearing was depressed to a decibel level lower than the preoperative level in 15 cases. That is, the hearing became worse in the operated ear.

5. Sub-divided into two parts: Group 1.—From 6 to 11 months, 32 cases. Group 2.—Six months and under, 38 cases.

6. Eight revisions were carried out in which the fistula had remained open in 6 cases. In two of these the fistula closed again.

7. There are 19 cases in which the fistula had closed and the hearing reached its preoperative level, all of which are to be subjected to revision.

Let us now analyze the failure for 15 cases:

Nine cases were subjected to revision, in removal of the new formed bone and scar tissue around the membranous labyrinth, the latter was subjected to further inflammatory reaction, with a resultant loss of function. Now with the dissecting microscope, and the use of cartilage this source of danger is greatly overcome.

In three cases the membranous labyrinth was injured at time of operation.

In one case the resultant vertigo was so severe and persistent that I re-entered the wound and removed the membranous labyrinth similar to the procedure I am now using for intractable vertigo in Ménière's disease.

In one case, a severe inflammatory reaction occurred in the flap and destroyed the membranous labyrinth.

In one case in which a postoperative facial paralysis developed following the operation, I performed an immediate decompression which cured the facial paralysis but destroyed the membranous labyrinth. It may be of interest to state that full recovery from a facial paralysis,[5] and by that I mean, muscular action and emotional expression recovery, can only occur in cases which have been subjected to immediate decompression before the condition of upper Wallerian degeneration can occur in the proximal segment of the nerve; this invariably results in a complete loss of occipito-frontalis movement, which, as a rule, occurs in every case recovering from facial paralysis. All these untoward incidents occurred to me in my first two years. Since then a most exacting application has rewarded me without any similar complications,

at the worst resulting only in a closure of the fistula.

The diagnosis of clinical otosclerosis is based on the following signs and symptoms observed in a case.

A history of familial deafness is obtainable.

Deafness for airborne sound is present, which is slowly or rapidly progressive in degree and extent, beginning in the lower frequencies first and finally involving the higher frequencies, and may be bilateral.

Hearing for bone-conducted sound (the degree of accuracy for its estimation still markedly limited), is prolonged over and above the hearing by air conduction, in the frequencies in which the hearing by air conduction is impaired.

The patients frequently believe they hear conversation better in noisy places.

Unilateral or bilateral tinnitus is present which may be mild or severe, continuous or intermittent.

The wide external auditory canals, atrophic tympanic membranes and a pinkish hue to the promontory is as a rule, but not always, present.

The Eustachian tubes are patent.

The Weber test, that is, bone conduction with a C 512 fork usually is lateralized to the worst of the two ears for air conduction sound.

Lempert describes nine different types of cases in which he states that the diagnosis of clinical otosclerosis cannot be excluded. His deductions may be correct but, after extensive investigations of flying personnel, coupled with otologic and audiometric research I am forced to the conclusion that we are just beginning to learn a little about hearing and how to evaluate and interpret its abnormalities. Anyone cognizant of the work of Bekesy will substantiate this view, I am sure.

I ask this question. Is there a critical hearing test by itself that will tell you what case is and is not suitable for operative interference?

1. Bone conduction; as yet there is not a receiver made that is reliably dependent. Furthermore, the method of measuring bone conduction with the audiometer is much too haphazard to give a repeated constant finding. A new type of bone conduction receiver which is calibrated is required and it must be supported by a head band to place it in the same position with the same amount of pressure at each frequency reading. At the present time I am using a bone conduction receiver on a head band of the type commonly used in the Maico bone conduction hearing aid with a special hookup to my audiometer both for decibel reading and speech reading.

2. Pure tone audiometry is helpful, provided the audiometer is calibrated, in addition to its ear piece, and repeated readings are made in the same noise level at varying intervals. I am using a calibrated Maico audiometer and ear piece in a sound-proof room with a noise level of less than 20 decibels measured by the noise level meter of the General Radio Corporation.

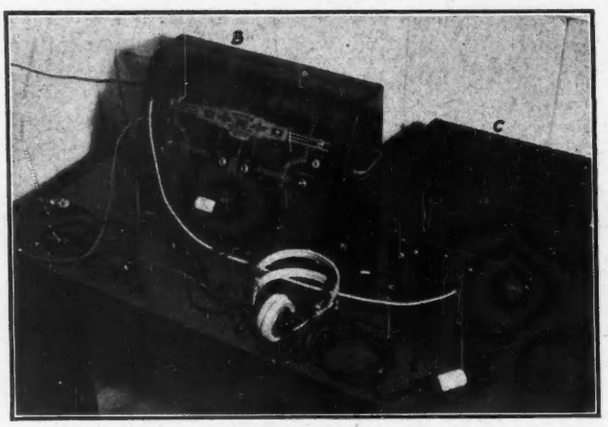


Fig. 1.—(A) Bone conduction receiver. (B) Maico audiometer. (C) Loudness balance apparatus. (D) Matched earphones. (E) Attenuator.

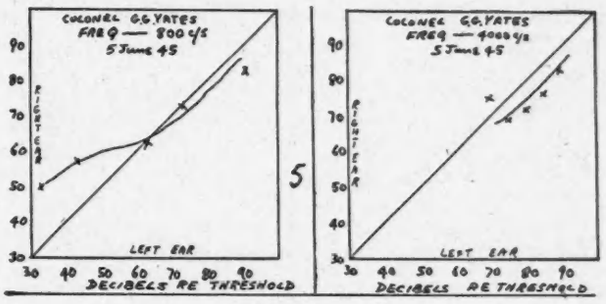
3. A phonographic attachment to the audiometer is used with a fair degree of a high fidelity pickup and an electrical transcription record of the type used by MacFarlane.

4. A masking noise from either audiometer which consists of a 60 cycle harmonic sound for masking the low frequencies, or preferably a specially built apparatus consisting of the above, plus a gas-filled triode ionization discharge for masking the high frequencies.

5. The loudness balance test.[6] This test, in my opinion, gives more information than any of the preceding tests. It is more reliable as an index to the type of case suitable for the fenestration operation than is the method of pure tone audiometry and its bone conduction interpretation. It is carried out in the following manner. At the chosen frequencies a sound is fed every one and one-half seconds to one of a pair of matched earphones on the patient's ear. If the two ears are the same the sound heard on each ear alternately will be equally loud. If the ears are not the same the sound is selectively adjusted on one of the ear phones until the loudness is equal. That is, the loudness is balanced one ear against the other, a measurement of the

voltage on the earphones on each ear is then made and the difference between the two voltages measures the difference in the loudness sensitivity of the two ears. The balance is carried out in steps from threshold level up to the limit of the patient's tolerance, where discomfort or pain occurs.

By this means we are able to determine to a certain degree whether a patient will hear equally badly when the sound he is listening to is raised above threshold or whether he will recruit, and in that way hears better above the threshold than he hears at the threshold compared to a normal subject. By recruitment, is meant that the basilar membrane increases in its response to sound in a different fashion to the conductive apparatus in a case of deafness. The loudness balance test is explained by Lorente de No upon the basis of increased intensity activating any remaining nerve fibres. The test is based upon the findings that in monaural pure conduction deafness there is no change in the relative sensation of loudness in the two ears at any intensity for a given frequency. On the other hand, in monaural nerve deafness, the poorer hearing ear hears more and more acutely as the intensity of sound increases till both ears are almost equal at some intensity well above threshold. If there is unilateral total deafness there is no balance established between the ears. This test may also serve as an indication of the amount of nerve destruction present in any particular case. For example, a person with nerve deafness hears better above threshold than a normal person because at that level he draws on all his resources to hear. The following charts will illustrate the above test.



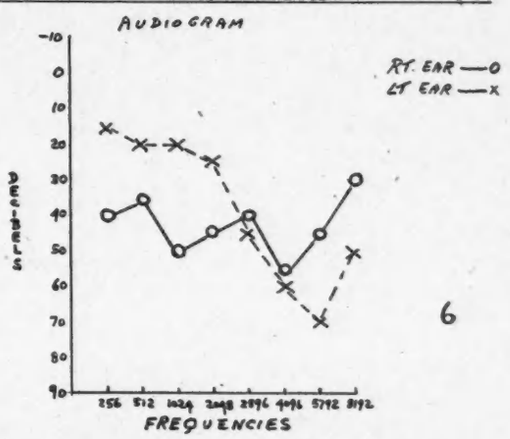
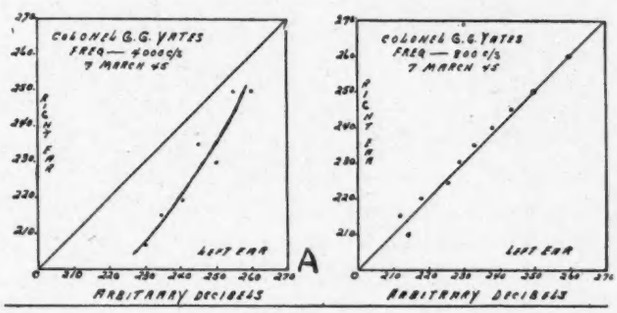


Chart 5.—Postoperative loudness balance graph.
Chart 6.—Pure tone audiometric reading.



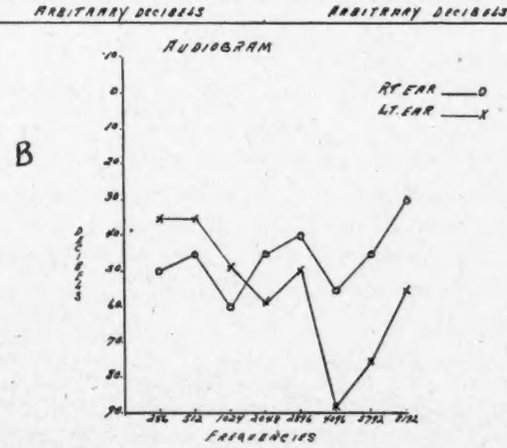
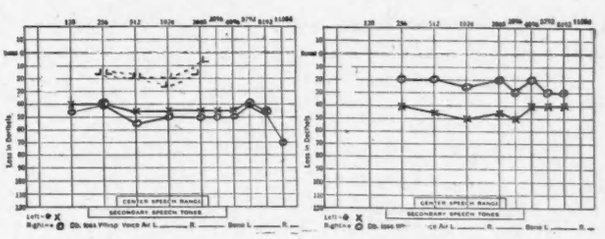


Chart 1.—(A) Preoperative loudness balance graph. (B) Pure tone audiometric reading.



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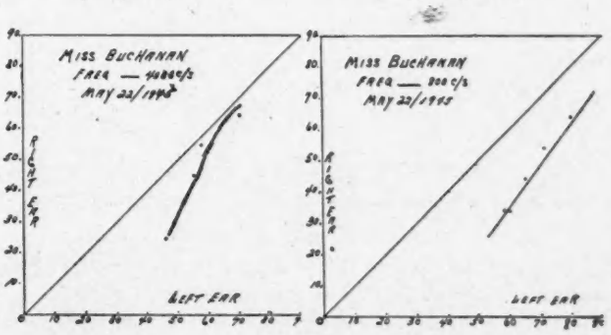

Chart 9.—Graph showing binaural loudness balance, conductive in type. The hearing of one ear is plotted in terms of the other.

The impedance of the external auditory canal is now measured both before and after operation to determine in a series of cases what effect, if any, this bony auditory reconstruction has on the over all aspect of the change produced mechanically in the hearing picture.*

SUMMARY

1. In clinical otosclerosis cessation of the progress of the deafness can be obtained by the establishment of a permanent labyrinth fistula. But to obtain an important, lasting improvement of the hearing power a second condition is required; the adaptation to this fistula of a new tympanic system as amplifier of the aerial sound vibration.

2. The duration of the functional benefit depends on the permanence of the anatomical modification. This permanency is difficult to obtain and it is possible in a high percentage of the cases. This is, in the first place, a question of technique and of a choice of the patient to be operated on.

3. The principle of the effectiveness of the surgical treatment in otosclerosis an affection hitherto considered as incurable seems undoubtedly established.

4. I can only reiterate, with emphasis, from practical experience, this statement, namely, the degree of improvement in hearing which is obtained and maintained as a result of such plastic reconstruction of the auditory mechanism in a otosclerotic ear depends directly on and is in direct proportion to the exactitude and perfection with which each major step in this technique is completed, plus the finesse employed in execution of each of the technical minutiæ.

In conclusion, Dr. Harris P. Mosher, speaking before the American Laryngological Association, June, 1944, made this authoritative statement,

> "I am waiting for the five and ten year results of this operation. It is clear that it is not a procedure for the occasional operator. My prediction is that 15 to 20% of these operations will be permanently successful. For a man who has real worth while work to do in this world, to regain usable hearing for three to five years is more than worth while and justifies the procedure."

It looks, at times, as if we should have to recast our knowledge of the physiology of the ear on account of this epochal advance in otologic surgery.

* This precision measurement introduced originally by P. D. Flanders, Bell Telephone System, New York, is being carried out in the Research Otological Laboratory of the R.C.A.F., Physics Building, University of Toronto, Toronto.

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CORNEAL TRANSPLANTATION

By Jean Audet-Lapointe, M.D.

Ste. Justine Hospital, Assistant in the Faculty of Medicine of the University of Montreal, Fellow American Academy of Ophthalmology and Oto-Laryngology, Montreal

THIS is not the occasion, neither is there time to give a complete study of this highly important and interesting subject. I think however that it demands our close attention in order that we may arrive at definite results.

Last year I reported on my experiences in plastic operations on the cornea and described the difficulties of obtaining clinical material and also eyes from the cadaver. This was at the April, 1944, meeting of the Association Canadienne Française des Ophthalmologistes et Oto-Laryngologistes de la Province de Québec. I showed that it was necessary to demonstrate the value of such an operation before expecting it to be undertaken. Since then I have been able to operate successfully on three patients, one of whom has already been presented at the December meeting of the Bureau Médical de l'Hôpital Ste. Justine, and also before the Montreal Ophthalmological Society at the Montreal General Hospital. I had been unable to obtain photographs before and after the operation at the time and hoped to have her appear at a later meeting. Fortunately I have seen her lately and this photograph was taken ten months after the operation. The patient herself lived at a considerable distance from the city. The second patient I shall report on in detail below. There are also two other patients who are under treatment at the moment.

CASE REPORT

R.L., aged 14, was admitted to the Ophthalmological Service of St. Justine Hospital on June 19, 1944, with infection of the right eye. He was discharged on August 4, with complete leucoma of the cornea. The family was told that the lesion had been considered as incurable

until of recent years and even now there was very slight hope of effective treatment.

The patient was referred to me in October, 1944, three months after his discharge. At that time the operation of corneal transplant was proposed and agreed to.

The personal and family history showed nothing of importance. The source and type of the original infection of the eye was uncertain and could not be defined. There had been all the signs of acute conjunctivitis, with intense injection and abundant purulent discharge with œdema, photophobia, and pain. The infiltration of the cornea and the loss of vision supported the diagnosis of purulent ophthalmitis.

The general physical examination showed nothing of special note.

The urinalysis was normal, the blood count was within normal limits. The Wassermann reaction was negative. Cultures from the eye had shown only Gram-negative intracellular diplococci.

The treatment had consisted of lavage with mercury bichloride 1/10,000; powdered vaporized dagenan; atropine and pilocarpin; cold compresses; anti-typhoid vaccine; and intramuscular injections of sterilized milk.

Fig. 1. Patient No. 1.—Corneal transplant left eye.

Fig. 2. Patient No. 2.—Corneal transplant in right eye. Vision 1/60.

Fig. 3. Patient No. 3.—Corneal transplant in right eye. Vision 1/60.

Operative treatment—first stage.—A preliminary keratectomy was carried out on October 26 in the course of which a small corneal perforation occurred necessitating an iridectomy and conjunctival overlapping. The operation lasted for 1 hour and 10 minutes.

The patient left the hospital on November 30 convalescing satisfactorily and reported to the clinic for treatments. When seen in December, 1944, the wound had healed and the leucoma had noticeably diminished. The cornea had cleared up in its periphery. There were no anterior synechia and I suspected a secondary cataract. There was no vision.

Second stage.—On January 15, 1945, a second keratectomy with skin grafts was performed. Convalescence was satisfactory.

Third stage.—On April 20, I was able to obtain a human eye. The patient was re-admitted and immediately the third stage was carried out in the form of a corneal transplant. The cataract was removed during the operation. Dressings were removed on the 8th day and in 15 days there was complete healing with a transparent cornea. The vision was 1/60.

DISCUSSION

A corneal transplant is possible. The operation has been carried out with success for the last 6 years in the United States, particularly by Castroviejo of the Ophthalmological Institute of New York, whose technique we followed. In selected cases one can obtain 75% success and in less favourable cases 20%. We have been studying the matter from the experimental point of view since 1939 and we feel now that it should be clinically applied. It is of course necessary that we should have sufficient clinical material. It has required many years to convince the American medical profession as to ocular grafts but by now there has been a large number of such operations with successful results. We hope to benefit by their experience. There is an Association for the protection or prevention of blindness as well as societies for caring for the blind. We would like to see also a committee which would inquire into all cases of blindness which might receive some degree of relief by employing this new therapeutic method of keratoplasty. Many patients have been declared incurably blind before the progress which has been made in recent years. The matter is being studied but at the moment we wish only to present our first observations. The lack of clinical material is hard to understand since in all other fields of social and preventive medicine the public is fully informed as to what may be done for the preservation of health. It seems as if in the domain of blindness there is more indifference and less enthusiasm in spite of the great progress which has been made. In the United States there is an organization of 19 hospitals in New York and the vicinity which have arranged to co-operate in pooling ocular tissues. It seems impossible that this question should be overlooked much longer amongst us and I present this report to stimulate and encourage

further study; good or bad results should be known and the work must go on and will, to obtain surely perfect results if co-operation needed is obtained.

SUMMARY

In summary, it may be said that of 5 cases operated on in the last year, 2 have been failures. Of the other three, one is satisfactory, another has only mediocre results and in the third case in spite of a perfectly transparent cornea there is a bloody exudate in the anterior chamber which interferes with the vision. There are many factors to be considered before undertaking a corneal transplant, for even if the operation succeeds from the æsthetic point of view, there is not always a good physiological result.

Carre St. Louis.

RÉSUMÉ

Les transplantations cornéennes sont difficiles mais elles sont réalisables dans certains cas bien choisis. On devrait faciliter davantage la tâche de ceux qui pratiquent cette délicate opération. Chez cinq malades opérés depuis un an, deux transplantations ont échoué et trois ont été suivies de résultats variables étiquetés comme suit: un succès, un résultat médiocre et un succès compliqué d'hyperhémie de la chambre antérieure de l'œil. L'ophtalmologiste qui tentera cette opération devra en connaître parfaitement la technique et savoir prévoir les désordres physiopathologiques éventuels. JEAN SAUCIER

A CASE OF FUNNEL CHEST

By Squadron Leader G. W. Manning, R.C.A.F.

IT has been shown that severe deformities of the spine tend frequently to result in pulmonocardiac failure. Kerwin[1] recently has reported five cases with severe scoliosis or kyphosis. From this study and a review of previously reported cases Kerwin concluded that "the significant pathological lesions are the result of pulmonary hypertension, which eventually leads to right-sided heart failure and appears to be due to mechanical interference with respiratory function. . . ."

In Kerwin's series it is reported that pulmonocardiac failure due to a marked spinal deformity occurred on an average of only once in every 1,340 routine autopsies (0.075%). One case in the series was due to a congenital lesion, the remaining four having resulted from pathological lesions of the bones.

Congenital abnormalities of the ribs are fairly common. Cervical rib, exostoses, bifurcation, congenital absence and aplasia have all been reported in the literature. Such abnormalities are encountered in the course of examining many thousands of recruits for the armed services. Barker[2] recently reported a case and briefly reviewed the literature on congenital aplasia of the costal cartilages. Although few cases of funnel chest were reported prior to 1900, the condition has been recognized since the sixteenth century.[3] A number of reports including operative techniques have appeared since 1900.[3, 4] Truesdale and Hyatt[3] from their investigations were led to believe that funnel chest although thought to be rare, is a fairly common imperfection, and the majority of patients experience no symptoms. They also state that the advanced form causes a permanent shift of the heart and respiratory tree and often restricts the vital capacity of the young adult. Brown[5] has shown that the heart may be fixed in the mid-line and encroached upon by the sternum or it may be displaced to either the left or the right side of the thoracic cavity. The greatest cardiac embarrassment appears to be present when the heart is fixed near the mid-line and is directly compressed by the sternum. Brown also considers that lateral displacement is not a great handicap.

The case reported here may be of interest in that it presents a marked congenital chest deformity in a healthy young man with no spinal curvature but definite cardiac displacement. Although it is a malformation of the bony thorax it is not the type of mild costal anomaly usually seen. The thoracic cage is quite intact, scoliosis or lordosis is absent, but there is a marked depression of the sternum, the typical funnel chest or pectus excavatum. Such a deformity may play a part in pulmonocardiac failure.

CASE REPORT

On examination a healthy 26-year old airman was found to have a marked depression of the anterior chest wall. There was nothing of significance in the past history except a history of measles followed by pneumonia at the age of 5 years. Tonsils had been removed 21 years ago. This chest deformity had been present since birth. There had been no symptoms of dyspnœa nor any illness that could be related to the deformity. He had been active in sports and had

become a provincial boxing champion during civil life. He stated that his reason for not continuing on to professional boxing was that if this were done it would be necessary to strip to the waist in the ring. Rather than expose this chest deformity, he chose to remain out of the professional ring against the advice of his trainer.

On examination he appeared a well-built athlete with a very erect posture. He was 6′ 1″ tall and weighed 156 lb. The chest circumference was 36 inches. The cardiovascular system appeared quite normal and the remainder of the examination revealed no significant abnormalities. The vital capacity on three estimations was found to be 5,270, 5,360 and 5,760 c.c. with little or no chest expansion.

On closer examination of the chest the apex beat was observed at the left anterior axillary line. The chest appeared to be divided into two symmetrical halves by a deep depression (Fig. 1). The depression

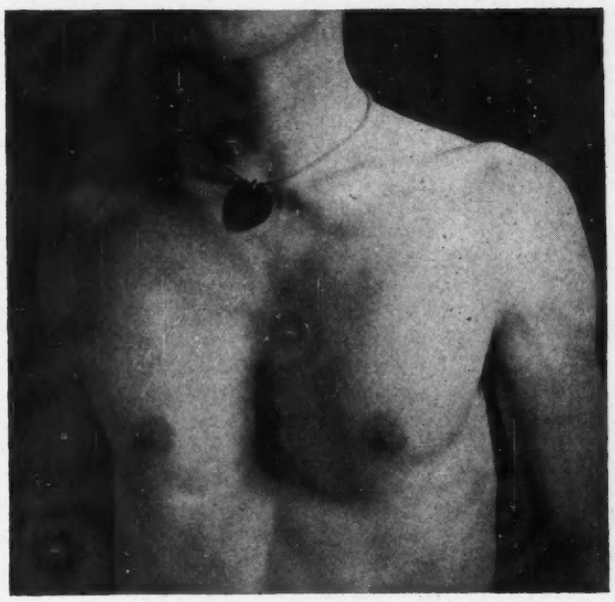

Fig. 1.—Erect position. Sternal depression evident.

measured 19 cm. in vertical length and 15 cm. horizontally (Fig. 1). The depression was 5.7 cm. deep, measured from the anterior chest wall at the level of the nipples. This deformity was more marked than appears in the photograph (Fig. 1). The thorax was quite firm and rigid. Respiration was abdominal (diaphragmatic) rather than by costal movement.

Electrocardiograms and heart-sound tracings were taken in the recumbent and standing positions. Similarly chest x-rays were taken in the recumbent, standing, and right lateral positions. The electrocardiogram findings are illustrated in Figs. 2 and 3. A normal sinus rhythm with a heart rate of 47 beats per minute was present in the resting recumbent position with a P-R interval of 0.18 seconds, QRS time of 0.12 seconds and a tendency to right axis deviation of about plus 80°. In the standing position the heart rate was increased to 79 per minute, the P-R interval reduced to 0.16 seconds, and the QRS time remained at 0.12 seconds. A shift in the electrical axis to a definite right axis deviation of plus 125°, a definite lowering of the T wave amplitude in all three leads (particularly Leads II and III), and a marked increase in the amplitude of P2, were produced by a change from the recumbent to the standing position (Fig. 2). From the appearance of the chest, the position of the apex beat and the location of the heart in the chest as shown by x-ray (Fig. 4) one might suspect that some degree of left axis deviation would be present. It has been shown, however, that rotation about the antero-posterior and longitudinal axis of the heart, rather than lateral displacement, is responsible for the degree of axis deviation produced.[6] There is a definite displacement and perhaps some rotation to the left about the A-P axis. However, due to the deep sternal depression forcing the heart to the left, and the fact that the heart is anchored to the mediastinal structures about the base, rotation (to the left) about the longitudinal axis may have occurred resulting in a right rather than left axis deviation. A greater rotation about the longitudinal axis due to a twisting or torsion of the heart by the chest deformity may have obliterated the left axis deviation and swung the electrical axis over to the right. In the erect position of the right axis deviation was increased by movement of the apex downward and to the right, and perhaps also by some additional rotation about the longitudinal axis, in the same direction (counter clockwise) as that produced by the chest deformity.

An attempt was made to obtain heart sound recordings over those regions which would correspond to the mitral or apical, left sternal, aortic, and pulmonary areas of the normal chest (Figs. 2 and 3). From the records obtained it was apparent that a systolic murmur of low intensity was present (Fig. 3), in areas corresponding to the apical and left sternal border regions of the chest wall. This murmur, although still present was considerably reduced in the standing position (Fig. 2). There was no evidence of other cardiac murmurs in the records.

X-ray examination revealed the location of the heart to the left of the sternal depression and vertebral column in the left half of the thoracic cavity (Fig. 4). The heart appears somewhat elongated with a slight prominence of the pulmonary conus (Fig. 4).

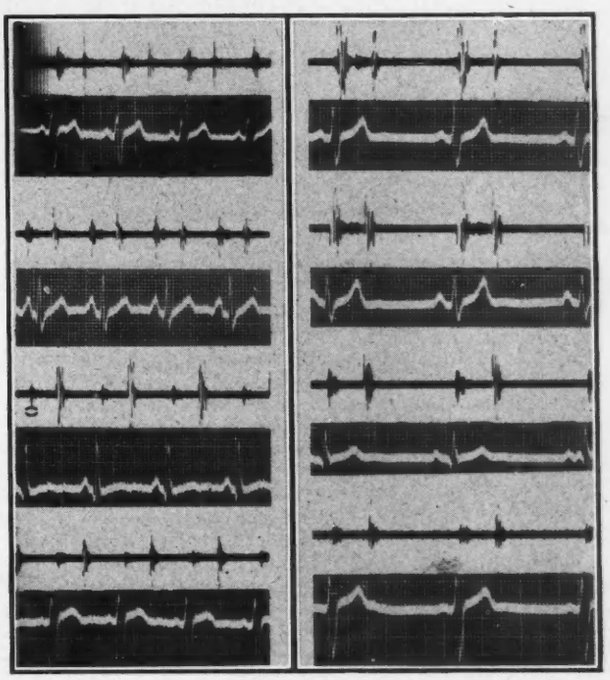

Fig. 2 Fig. 3

Fig. 2.—Records taken in standing position, midinspiration. Right axis deviation. Heart sound records show little or no evidence of systolic murmur.

Fig. 3.—Electrocardiogram and heart sound recording, recumbent position, midinspiration. Lead I with microphone over apical region. Lead II with microphone over left sternal border. Lead III with microphone over pulmonary region. Lead IV F with microphone over aortic region. Tendency to right axis deviation, and evidence of systolic murmuring over apical and left sternal regions.

Since the heart is displaced to the left, rotated to the left about the A-P axis, and probably rotated counter-clockwise about the longitudinal axis, the heart borders are somewhat confusing and may account for the apparent prominence of the pulmonary conus (Fig. 4). Such rotation would bring the right ventricle and pulmonary conus toward the left side and thus a more prominent bulging of the left border in the region of the pulmonary conus would be more apparent than that usually seen. A right lateral chest plate verifies the sternal depression of 5.7 cm. and illustrates the antero-posterior relations of the heart and sternum.

Chest x-rays were taken in the recumbent and standing positions for comparison with the electrocardiogram findings. It was found that accompanying the increase in the degree of right axis deviation from plus 80° to plus 125° following a change from the recumbent to standing position, the heart moved

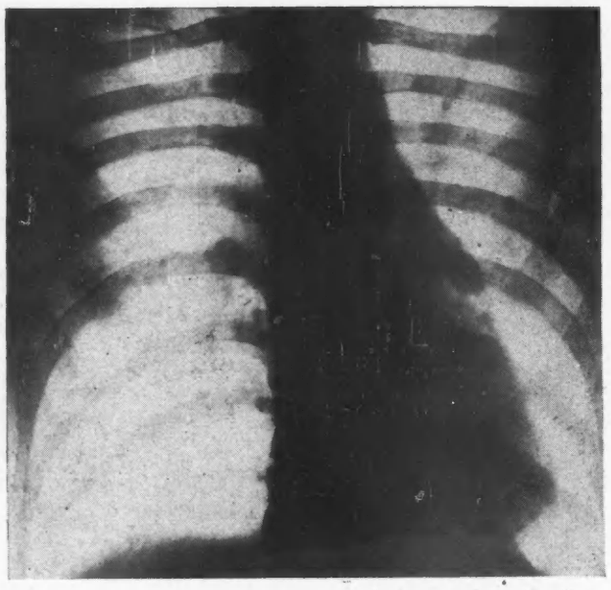

Fig. 4.—Antero-posterior x-ray of chest, showing left lateral displacement and prominence of pulmonary conus (see text). (Six foot chest plate reduced).

downward and to the right. Similarly deep inspiration pulled the apex downward and to the right. The occurrence of right axis deviation in the presence of left displacement of the heart has already been explained on the basis of cardiac rotation. The further increase in the degree of right axis deviation was then verified by x-ray visualization of cardiac movements with changes in posture and respiration.

There were no signs or symptoms of pulmonary or cardiac distress on examination or in the previous history of this patient. However, it has been pointed out that in cases of severe spinal deformity resulting in pulmonocardiac failure, the length of time from the onset of the more acute manifestations till death is relatively short.[1]

SUMMARY

Since right-sided cardiac failure in these cases is in all probability due to the mechanical interference with respiratory function there is the possibility that this type of chest deformity may likewise indicate a poor prognosis. The vital capacity was excellent although respiratory movements of the thoracic cage were absent. The marked chest deformity together with its displacement and torsion effect on the heart and blood vessels may well be factors in the eventual development of right-sided failure in this patient in the future. The electrocardiograms and x-rays, although they do not reveal definite evidence of pulmonary or cardiac disease, show that a marked chest deformity is present with a considerable degree of cardiac displacement and that rotation has occurred. It is possible that some impairment of the pulmonary circulation has already occurred, and that the right axis deviation and prominence of the pulmonary conus are indicative of right sided cardiac enlargement.

Sincere appreciation and thanks is expressed to the President and members of No. 2 Medical Selection Board for their assistance in the clinical examination of this case and to the late Surgeon M. Powers of the R.C.M.P. who very kindly made the reproductions shown in the report.

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A SOURCE OF DANGER IN THORACENTESIS AND ITS PREVENTION*

By Walter E. Kunstler, M.D. F.R.C.S.[C.]†

Montreal

THORACENTESIS is one of the most important means of establishing a diagnosis and determining the nature of fluid in the pleural cavity. Very often, the general practitioner is called upon to aspirate the chest of a patient on whom he has made a provisional diagnosis of fluid by physical examination, and x-ray facilities may not be immediately available, especially in rural districts, or the patient's condition does not warrant transportation for a long distance without decompression of the pleural viscera by emergency thoracentesis.

It is customary to needle the chest in the midaxillary line in the fifth or sixth interspace

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† At present on active service.

or below the angle of the scapula corresponding to the seventh or eighth interspace. Almost all textbooks give this advice and most of them recommend that the procedure be carried out with the patient in the sitting position, while some mention also the recumbent one, the patient lying on his back or stomach near the edge of the bed. The sitting-up position facilitates the withdrawal of fluid even if it is present only in small amount (200 c.c.). The procedure is, however, by no means without danger and the textbooks warn not to needle too low down in order not to puncture the diaphragm. But even then, caution is indicated and the following case* will illustrate how an erroneous diagnosis by thoracentesis was followed by a train of consequences due to an untimely and ill-chosen procedure.

A man, 35 years old, suffered from a furuncle on the left side of the neck. Two weeks later, he felt some discomfort in the left lateral part of his lower chest, with some dull pressure which slowly increased in intensity. There was no fever and there were no symptoms of any respiratory infection. At the end of four weeks, after a journey of four hours, the patient became suddenly ill; he vomited and complained of headache and nausea. His temperature rose to 105° after a chill. Within the next two days, some dyspnœa and cyanosis appeared. Examination revealed absence of breath sounds over the left side with absolute dullness over the lower left chest. A diagnosis of exudative pleurisy of unknown origin was made. The temperature remained between 102 and 103°. The consultant physician, a specialist in internal diseases, of high standing, needled the chest with the patient sitting up, at the eighth interspace in the midscapular line. At a depth of about four centimetres, he encountered thick creamy pus of yellow colour and withdrew about five c.c. for bacteriological examination. A diagnosis of acute empyema of the pleural cavity was made, and the patient was transferred to a hospital where x-ray films showed complete obscurity over the left chest limited below only by the gas bulla of the stomach. There was marked shifting of the mediastinum to the right.

On account of fever, a high leucocytosis, the presence of Gram-positive cocci arranged in grape formation in the aspirated pus, and the marked dyspnœa, it was decided to drain the empyema by open rib resection. The surgeon called in on the case relied on the diagnosis of the physician, and under local anæsthesia, resected four cm. of the 8th rib below the inferior angle of the scapula. Opening the pleura, he obtained to his astonishment, clear yellow fluid which proved, later on, to be sterile. He immediately considered the presence of a pus pocket, situated between the lobes or under the base of the lung. The pleural exudate therefore was regarded only as a reactive one. As he had relieved the shift of the mediastinum and the embarrassment of the respiratory and circulatory system, he did not wish to investigate further for the time being, but sent the patient again for x-ray examination.

X-ray now revealed a partial pneumothorax, the mediastinum back in its place and the left diaphragm outlined, but about two interspaces higher than on the right side. Between stomach and diaphragm was an opaque shadow with a convexity against the pleural cavity, slightly movable on respiration. There was no fluid level, except a minimal collection in the costophrenic angle which moved away when the patient's chest was tilted laterally. The diagnosis of a subphrenic abscess was now made (Fig. 1).

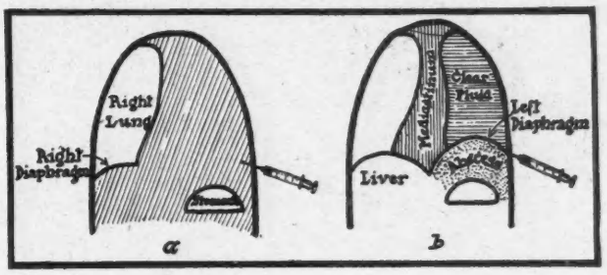

Fig. 1.—(*a*) X-ray appearance of fluid. Syringe aspirates apparently pus from pleural cavity. (*b*) True localization of fluid. Aspirated pus originates from subphrenic abscess.

Although the dyspnœa was relieved, the fever remained at around 102°, the patient losing weight and resistance. Two weeks after the first intervention, the patient's circulatory system began to be impaired. The lung re-expanded enough to seal off the pleural cavity. Evacuation of the abscess which contained about 500 c.c. of yellow creamy pus, was performed by resection of a piece of the ninth rib and needling through the greatly elevated diaphragm. The patient's condition improved rapidly. A sinus remained for nearly three months and then closed spontaneously. The evacuated pus was found to contain *Staph. aureus.*

Fortunately, this case had an uneventful recovery; it could have turned out differently considering that the mortality rate for metastatic subphrenic abscesses—a relation of the dermal focus and the abscess seems to be logical—was at that time (before the discovery of effective sulfonamides) about 50%. Had the aspiration been carried out at another level, clear fluid would have been withdrawn, relieving the dyspnœa, but indicating at the same time the presence of another focus. Pulmonary disease or abscess would have been suspected. The fluid, being withdrawn and replaced partially by air, a new x-ray would have shown an elevated diaphragm. A rib resection would have been carried out lower down and the approach to the abscess been entirely extrapleural. Preliminary packing would have obliterated the costophrenic angle and the fear of contamination of the pleural cavity been very remote.

Besides the error, mentioned in this case report, other mistakes may happen if needling is carried out at too low a level. The cases are not uncommon where the aspiration of air from the stomach has led to the diagnosis of a spontaneous pneumothorax (in elevation of diaphragm or diaphragmatic hernia). On the other hand, fluid may be present in the pleural

* Observed while doing postgraduate work on the Continent.

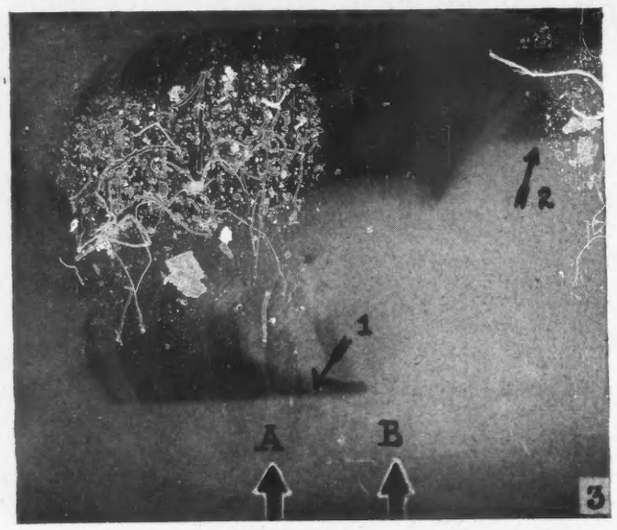

Fig. 2.—Position of choice, allows withdrawal of minimal amount of fluid, complete evacuation and avoids potential errors in diagnosis.

Fig. 3.—X-ray appearance of fluid level in position advocated: (1) pleural fluid; (2) gastric fluid. Place of thoracentesis: (A) right, (B) wrong.

cavity but cannot be obtained due to phrenic paralysis or diaphragmatic pleuritis.*

How may an error of this magnitude be avoided?

Excluding the unusual case of localized fluid accumulation without general exudative pleurisy which can very rarely be diagnosed clinically alone and which needs the aid of x-ray localization, there is a very simple method of thoracentesis which is well known to chest physicians and thoracic surgeons, but which seems to be little employed in general practice.

In the method advocated here (Fig. 2), the patient lies on his diseased side, the chest suspended by placing the hips at the edge of the bed and the shoulders and head on a chair at a distance of not more than one foot from the bed. The drainage is carried out in the mid-axillary line about the fifth interspace, and is sometimes compared with the draining of the oil system in an automobile, the tap being at the lowest level. The operator sits or kneels on a pillow on the floor. Thus, it is not only possible to obtain fluid, even if present only in an amount of 10 c.c., but also to drain the thoracic cavity completely including all the sediment, otherwise collected in the costophrenic sinus. Fig. 3 gives an x-ray view of the fluid level in the described position. At the Grace Dart Home Hospital and the Royal Edward Laurentian Hospital in Montreal, this is the adopted procedure, when little fluid is present or when complete evacuation of fluid in staphylococcal or mixed infected empyema is to be obtained prior to the introduction of penicillin. The patient usually stands this position well, as the gravity of the fluid tends to pull away from the compressed lung, relieving the shift of structures in cases of mediastinal instability. Furthermore, by sagging of the body between the supports, the interspaces widen and the introduction of the needle is greatly facilitated.

It is true that in many cases there may be apical or lateral adhesions, however, experience gained by several hundreds of thoracoscopies and on autopsies has shown that these adhesions are (1) usually more posterior; (2) not continuous, and (3) not more developed than lower down and nearer to the costophrenic sinus. Therefore, if no fluid is obtained, the needle may be inserted more to the front, or in rare cases, more to the back at the same interspace, and the patient rolled over to a greater or less degree in order that the needle may always be at the lowest point.

SUMMARY

Thoracentesis is dangerous if performed low down with the patient in a sitting position. In case of elevation of the diaphragm (adhesive pleurisy, subphrenic abscess, phrenic paralysis) the aspiration of air or gastric content, of pus, or a negative result of aspiration may lead to wrong diagnosis. Infection of the pleural space may take place by transpleural needling. One case is reported in which thoracentesis, thus performed, led to erroneous diagnosis and treat-

* Major M. Aronovitch, R.C.A.M.C., at the meeting of the Section of Tuberculosis, Montreal Medico-Chirurgical Society in 1942, and in a personal communication, pointed out, that elevation of diaphragm often precedes the onset of diaphragmatic pleuritis. This elevation may be assumed to be caused by splinting of the diaphragm. The mechanism is similar to the muscle "splinting" which gives rigidity to the abdominal wall when the peritoneum is inflamed.

ment. A method of thoracentesis is described, which is more satisfactory, is applicable in cases of even very small amounts of fluid and especially, when complete evacuation of pus and sediment is demanded for the introduction of penicillin.

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ANÆMIAS OF THE NEW-BORN*

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ANÆMIA is any state in which the hæmoglobin is less than normal in proportion to the blood volume, and this state can arise from several causes, such as blood loss, failure of cell formation or hæmoglobin, excessive cell destruction, or combinations of these conditions. Anæmia of the new-born is a symptom rather than a disease, but it may be such a prominent and serious symptom that the underlying disease remains hidden in the background. It is not common, but when it occurs the hazards of survival are definitely increased, consequently, it requires immediate diagnosis and it calls for urgent treatment in order to save life.

In seeking the causes we should be justified in suspecting the mothers as the source. Those who have been ill during pregnancy, those with toxæmia, or of advanced age and weak constitutions; those who have had repeated abortions with severe secondary anæmia; those that have been poorly fed during pregnancy; all these various types can be expected to produce weak anæmic babies. There is a significant relationship between the diet of the mother and the condition of her infant at birth, and when nutrition during pregnancy is inadequate, the fetus suffers to a greater degree than the mother. Although it does on occasion happen, the anæmia of the mother is not necessarily transferred to the baby, probably because there is no connection between the maternal and fetal blood formation. A mother with pernicious anæmia, for example, produces a baby with a normal blood picture, or if the baby is anæmic the condition is found to have no causative relation to the anæmia of the mother. It is possible that inorganic poisons or hæmolytic drugs, such as the sulfonamides, may pass the placental barrier and act on the baby's blood, but these are not common causes. Thus, as a rule, we must study the baby itself to find the explanation of the occurrence of anæmia in the new-born, and because of the diagnostic problems involved this study can be intensely interesting.

A few years ago, Sanford, in Brennemann's Pædiatrics, stated that the anæmias of the newborn could be studied under three headings. First, anæmias in which a known cause could be demonstrated; second, those in which the factors were unknown, with erythroblastosis; and third, those of unknown cause without erythroblastosis. Other writers have grouped those of known cause as symptomatic anæmias and those of unknown cause as essential or idiopathic. Many theories were advanced to explain these latter types, such as allergy, hormones, bone marrow shock, toxins, heredity of a dominant or recessive factor, absence of the anti-hæmolytic agent, etc., but there were always cases where some link was missing and the theory became untenable. More recently, due to the interest of workers in hæmatology and observant clinicians the origin of the anæmias in Sanford's second group has been dramatically explained, and this discovery has completely changed our conception and treatment.

From a practical and clinical point of view we can, for our present purpose, review these anæmias under four headings.

I. ANÆMIA DUE TO HÆMORRHAGE

This type of anæmia may or may not be obvious, its degree depending on the amount and severity of the blood loss. If the red cells drop to 4,000,000, with a corresponding reduction in the hæmoglobin, hæmorrhage should be suspected. The anæmia is the normocytic hypochromic type, becoming microcytic if the loss continues. Nucleated red cells appear in the peripheral blood and the reticulocytes increase. The leucocytes are increased to 20,000 or 30,000 with a normal or raised platelet count.

Traumatic hæmorrhage occurs during the first two days and may be severe enough to cause anæmia, and diagnostic problems arise, if it involves such internal organs, as the liver, spleen or kidneys, or the body cavities, or if it is associated, as it often is, with hypoprothrombinæmia. Cerebral hæmorrhage may cause pallor and

* Read at the Seventy-sixth Annual Meeting of the Canadian Medical Association, Section of Pædiatrics, Montreal, Quebec, June 13, 1945.

dyspnœa. Bilateral adrenal hæmorrhage with marked shock and pallor is a cause of sudden death during the first week, but is not associated with anæmia. Congenital thrombocytopenic purpura or duodenal ulcer may be the origin of gross hæmorrhage, causing a severe anæmia, but these are rare.

The two most common diseases of the newborn in which spontaneous hæmorrhage occurs, and in which marked anæmia may be the outstanding symptom are hæmophilia and hæmorrhagic disease of the new born. Hæmophilia is rare and need only be mentioned, but must be eliminated in making the diagnosis. Its feature is the prolongation of the clotting time, which may be increased to hours, but the blood eventually clots. An unusual stability of the platelets is presumed to be the reason for the delay of the blood to clot. Treatment resolves itself into the giving of frequent transfusions, as no therapeutic agents are as yet available that will bring about any benefit. Recent studies of the coagulation defect promise to provide a key to the problem which will make available for these patients a remedy as specific as vitamin K in hypoprothrombinæmia, or as life-prolonging as liver therapy in Addisonian anæmia.[2]

Hypoprothrombinæmia is the most important cause of anæmia due to hæmorrhage, and if severe, an anæmia of a sheet-white type may be present. It may be defined as spontaneous internal or external hæmorrhage in the absence of trauma, infection, or disease. It takes the form of a constant oozing, rather than a gushing hæmorrhage and, unless checked, may rapidly exsanguinate the baby. Trauma may initiate the hæmorrhage, as some babies have a high prothrombin time without evidence of bleeding. The traumatic factor predominates as the cause of death in the first 24 hours, and hæmorrhage occurring between the 2nd and 8th day is practically always due to hypoprothrombinæmia alone. Diagnosis may be difficult, when we remember that the same pallor is characteristic of hæmolytic anæmia, and may also be seen, though rarely, in purpura. Prolongation of the prothrombin time to 200 to 300 sec. (normal 20 sec.) is the feature of hypoprothrombinæmia, while enlargement of the liver and spleen, and erythroblastosis distinguishes hæmolytic anæmia. Purpura shows a reduction in the number of platelets with an increase in the bleeding time and clot retraction time, but an increase in the coagulation time along with the family history differentiates hæmophilia.[2]

The incidence of this hæmorrhagic disease has varied considerably in different clinics, and the figures given are those obtained before the advent of specific therapy. The discovery of vitamin K and of its effect in the prevention and cure of this disease has been one of the outstanding advances in pædiatric history. Recent statistics prove that vitamin K has a definite life saving effect and the accompanying Table I emphasizes the results of its use in all types of hæmorrhage occurring in the different regions of the body.[3] Lehmann claims from the results of his observations of 13,000 infants that 1.6 per thousand of all infants born alive can be saved. The results are striking in the cases of intracranial hæmorrhage, in the face of which we all stood by so helplessly in the past. These results, confirmed now by many others, are so convincing that vitamin K is being routinely given to all mothers during labour, and all newborn babies, if the mother has not received it, or if the baby shows any evidence of injury, particularly cerebral, due to long labour or operative delivery. The majority respond with a rise in the prothrombin index. Cases not responding are rare and these are the ones caused by other hæmorrhagic factors, such as, fragility of the capillary vessels and deficiency of vitamin P. It appears from the literature that this latter problem too will soon be solved. Kato[4] has reported that with adequate vitamin K dosage in cases of hypoprothrombinæmia, there were no fatalities, while without it, the mortality was 30 to 40%. The dose at first advocated was 5 to 10 mgm., but as a result of recent work,[5] one-half to one milligram is considered ample, and to insure its absorption, it is given intra-

TABLE I.

SOURCE OF BLEEDING IN INFANTS DYING BEFORE AND AFTER THE INTRODUCTION OF PROPHYLACTIC TREATMENT WITH VITAMIN K

	Deaths from bleeding on			
	1st day		*2nd to 8th day*	
Source of bleeding	*1934 - 40*	*1940 - 43*	*1934 - 40*	*1940 - 43*
Intracranial.	21	14	16	3
Pulmonary..	11	2	8	1
Hepatic....	4	0	4	0
Adrenals...	2	3	2	1
Melæna....	1	0	1	1
Thymus, skin, etc..	2	0	3	0
Totals.....	41	19	34	6

muscularly. Babies with a severe blood loss will, of course, require one or two transfusions as well to restore their blood to normal.

II. The Anæmia of Infection

New-born infants vary in their response to infection with its resultant anæmia, one developing a severe condition with a slight infection, while another baby will not be affected. Some babies are more vulnerable than others, their hæmopoietic systems being stable or otherwise in the presence of infection. Anæmia lowers the resistance to infection and infection aggravates the anæmia. Usually, mild infections such as impetigo, naso-pharyngitis and furunculosis do not cause anæmia. On the other hand, severe pyogenic infections, septicæmia, and pyelonephritis especially together with pneumonia, may cause a serious drop in the hæmoglobin. Streptococcal and *B. coli* infections are more likely to cause anæmia than staphylococcal, although a hæmolytic staphylococcus may cause severe anæmia even of an aplastic type.

Of the chronic infections, congenital syphilis is the chief offender, and it must always be considered as a cause, while tuberculosis and malaria are rarely seen and need not be considered.

Acute congenital hæmolytic anæmia may follow infection, or occur as a result of prenatal or neo-natal sepsis, or broncho-pneumonia, although its relation to infection has not been clearly defined. In many cases the onset of the hæmolysis occurred one or two weeks after the time the infection subsided. However, this anæmia is rare in the first few weeks, and usually occurs after the first year of life. It has no relation to the hæmolytic anæmia of the new born due to iso-immunization and the Rh factor. Sickle-cell anæmia, occurring only in negroes, may be precipitated by infection at any age. The blood picture is characteristic and offers no difficulty in diagnosis.

Examination of the blood reveals, in acute cases, a rapid destruction of the red cells, while in subacute cases the rate of destruction is normal. There may be a combination of macrocytosis and microcytosis. There is also an interference with the synthesis of the hæmoglobin, with an arrest of erythropoiesis at the level of the normoblasts and primary erythroblasts with a drop in the total red cell count to 2,000,000. The white cells vary so much that very little diagnostic aid is obtained by the count. It may fluctuate from 4,000 to 50,000 and a count below or above these limits is usually of poor prognostic importance. Syphilis has a predilection for the bone marrow, and we may then have an aplastic blood picture, or that of hæmolytic icterus.[2]

As for treatment, iron has no effect during the active phase of the infection. It is not absorbed and is excreted more rapidly. When the infection subsides improvement is rapid in response to iron and vitamins. Transfusion is the only resource, if the anæmia and infection are at all severe, and should be repeated at intervals to secure the best results. When the anæmia persists in spite of treatment, there has probably been some destruction of the bone marrow.

III. Anæmia of Prematurity

This anæmia is a distinct entity beginning soon after birth, and characteristic of all immature infants. Its severity is governed by the state of maturity, an infant of 4 lb. having a hæmoglobin of 60%, while a 2 lb. baby will be more severely affected, and the percentage drops to 40. Following birth there is a rapid decrease in the number of red cells and their hæmoglobin content, the result of the change in the oxygen tension experienced before and after birth. The premature is born with a higher red cell count than the normal full time infant, and the post-natal drop is greater, but the remaining red cells are more fragile and the hæmoglobin is of embryonal type. The anæmia may not reach its maximum for 8 to 10 weeks and at 3 months a gradual improvement sets in. Various writers have shown that iron is not directly concerned in the causation of this anæmia. It is not prevented by the giving of iron to the mother or infant, and even though the storage is normal, the rapid growth of the premature baby uses the available supply rapidly so the amount becomes inadequate to meet the demand. These facts together with the immaturity of the hæmopoietic system, make it more difficult for these infants to perform post-natal adjustments, and to recover the normal volume of blood and its constituents.

In the early stages, the picture is that of a normocytic normochromic anæmia. Later, as the red cells increase in numbers, the hæmoglobin lags and hypochromic cells appear with a tendency to microcytosis. The leucocytes are normal in type and numbers, and the platelets are not altered. No abnormality in the bleeding

or clotting time is found, although the prothrombin time is often increased, making the premature baby a potential bleeder requiring vitamin K more urgently than a normal infant.

The diagnosis is established by the finding of an anæmia varying with the age and weight of the infant, and reaching its maximum by the 3rd month. Hæmorrhage and infection can easily be ruled out. Congenital syphilis can be disposed of by examination of the mother's blood and the presence of other symptoms.

Treatment with iron fails to influence the course of the anæmia during the early weeks, but becomes more useful from three months onwards. At this time also, there is spontaneous natural tendency to recovery. Transfusion has only a transitory effect, but is more important in the presence of infection and in overcoming complications, when it should be used frequently and the blood given in small amounts.

IV. ANÆMIA DUE TO HÆMOLYSIS

The discovery of the Rh factor in 1940 by Landsteiner and Wiener and the demonstration in 1941 by Levine of the rôle of this factor in the pathogenesis of hæmolytic disease of the new born have changed our entire conception of this disease and they have created an outstanding epochal advance by the discovery of the cause of erythroblastosis. As a result of this work we now know that, if an Rh positive father marries an Rh negative mother, their baby will be Rh positive, and iso-immunization of the mother's blood may follow. However, although this union occurs in 13% of marriages, only one in forty infants, born with the possibility of its occurrence, will show evidence of the hæmolytic disease. The reasons for this low incidence can be explained in several ways.

1. The first and second babies of the family may not be affected, because the mother's blood has not had sufficient stimulation to produce anti-agglutinins, and as modern families are restricted to one or two children, a great many families will escape, and not produce infants with the disease.

2. The permeability of the placenta to Rh positive cells varies at different times in the same woman and this barrier prevents the production of antibodies and their return to the fetal circulation. Transplacental iso-immunization is the essential mechanism responsible for the specific disease. A normal placenta may not be permeable to the cells or the agglutinins.

3. Some mothers may not be capable of being sensitized, producing no anti-agglutinins or comparatively weak anti-bodies even though the antigen is present in their circulations, and some women, if sensitized, appear to have the power to spontaneously desensitize themselves again.

4. An Rh positive father may be homozygous, Rh Rh (3 out of 7) or heterozygous, Rh rh (4 out of 7) and if the latter, 50% of his children will be Rh negative and be normal.

5. An Rh positive baby of an Rh negative mother may escape, if its Rh belongs to one of the sub-types which have recently been found to exist. The baby is normal because its Rh does not cause the production of anti-agglutinins in the mother's blood. This is strikingly illustrated in the case reported of a mother who had twins, both of which were Rh positive, but one was affected and died, and the other was normal and survived.[6] The titration of the mother's serum against the several types of the cells gave results as shown in Table II. The mother was

TABLE II.

TITRATION OF THE MATERNAL SERUM

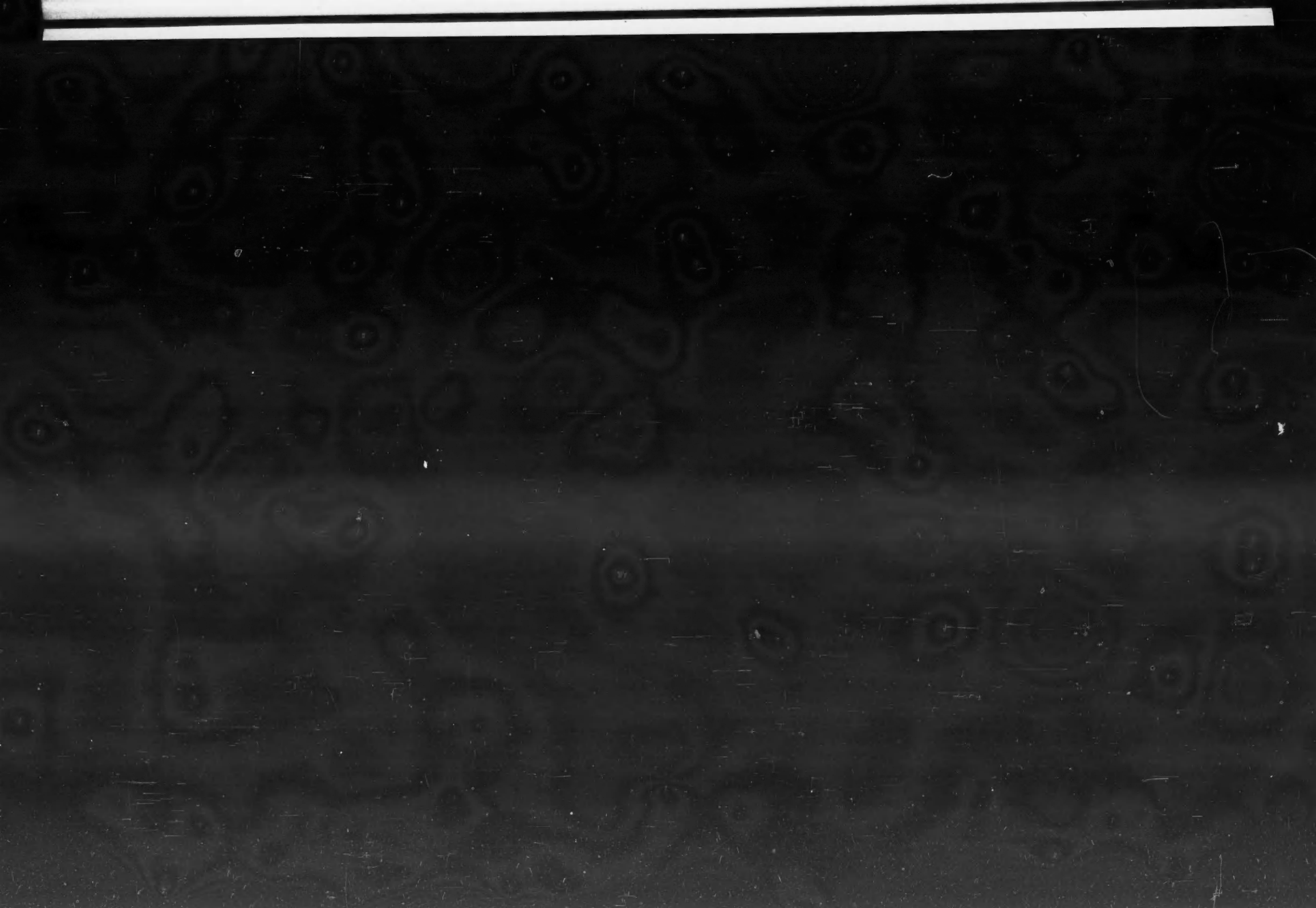
Cells	*Titre*
Rh_1Rh_2	64
Rh_1rh	32
Rh_2rh	16
Rh_1Rh_1	64
Rh′rh	4
Rh″rh	0
Rh-neg.	0

Mother Rh negative (rhrh)
Affected child Rh_1rh
Unaffected child Rh″rh
Father Rh_1Rh''
Maternal Anti-bodies Anti-Rh′

rh rh negative, while the affected child was of the genotype Rh_1 rh, and the unaffected Rh″ rh. The father must therefore have been Rh_1 Rh″. The maternal antibodies were of the type anti Rh′ and they completely failed to react with erythrocytes of a genotype like those of the unaffected infant, Rh″ rh.

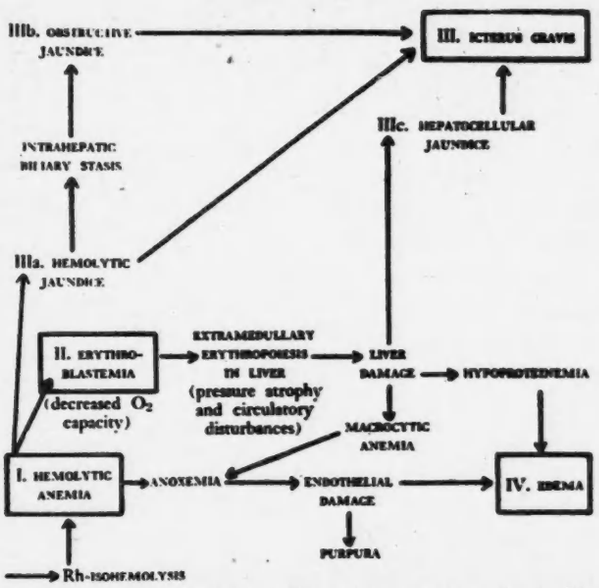
6. The disease may be so mild that it passes unrecognized, as mild cases of hæmolytic anæmia without icterus tend to recover spontaneously. The age of the fetus when the Rh begins to act and the length of time during which the fetus is exposed to this action are additional conditions influencing the severity of the disease.[10]

The pathogenesis of this disease is very interesting and only recently has it been clearly understood. Accompanying the hæmolysis there is an abnormal excessive regeneration of erythrocytes with the result that clinically we have it



appearing in three different forms, hæmolytic anæmia, the mildest form, malignant icterus which is a moderately severe type, and congenital hydrops, the most severe and most rare of all and usually incompatible with life. How these different syndromes are produced by the action of the original hæmolytic Rh factors is clearly illustrated in Table III. When the fetal

TABLE III.



PRINCIPLE: Rh-positive husband of Rh-negative woman transmits the Rh-factor to the fetus. Rh-antigenic substances pass from Rh-positive fetus through placenta and produce in mother Rh antibodies. The latter pass from mother to fetus through placenta, act in the fetus as hemolytic agents, and start the sequence of interlocking pathologic changes as presented in this chart.

erythrocytes are destroyed, the resulting anæmia causes anoxia, and the liver is overwhelmed, with icterus as the resultant clinical evidence. Erythroblastosis is the response of the bone marrow to the hæmolysis and foci of erythropoiesis develop in different organs, especially the liver, producing pressure atrophy and circulatory disturbances. The liver damage is the forerunner of hypoproteinæmia, which, with the endothelial damage caused by anoxia, leads to œdema. Thus hydrops is the most serious manifestation of the disease, with icterus gravis in the middle position. If the process stops with hæmolysis only, with or without erythroblastosis, we have the mildest form, the one that may recover without treatment.[7] It should be understood, of course, that 10% of cases of erythroblastosis are not due to the Rh factor and isoimmunization.

The hæmolysis of the blood tends to diminish by the end of the first week and may have ceased entirely by the third or fourth. No explanation has been offered to explain the continuation of the destruction of the red cells after the baby has been separated from the mother. One should expect spontaneous cure at birth, when no more anti-Rh agglutinins are coming through from the mother. Until birth, there may be an interchange of the baby's antigenic substances and the mother's antibodies neutralizing the specific anti-bodies in the mother, which may explain the higher titre in the mother's serum after 10 days.[10] After birth it is presumed that the agglutinins are quiescent or stored in the endothelial cells, or bound in some way to the Rh positive cells, and are liberated into the circulation until they have all been neutralized. It is possible for all the baby's original cells to be destroyed, the transfusion replacement with Rh negative cells keeping it alive. The baby becomes temporarily Rh negative, but reverts to its original positive when its hæmopoietic system has had time to produce sufficient new red cells. It should also be realized that the anti-Rh agglutinins have been demonstrated in the mother's breast milk, and these infants should therefore not be nursed,[8] although others claim that this is not of sufficient importance to necessitate weaning.

The diagnosis is established (Table IV) if we have a baby born with jaundice, with an enlarged liver and spleen and a blood film showing a marked increase in the number of erythroblasts, or if we have a baby developing a sheet-white pallor during the first week with no evidence of hæmorrhage. If, in addition, we can show that the father is Rh positive, the baby Rh positive, and the mother Rh negative, and can demonstrate that the mother has anti-Rh agglutinins in her blood, there is usually no doubt that we are dealing with hæmolytic disease. Anti-Rh agglutinins are almost absolutely pathognomonic of the disease, while the other manifestations may be found in certain other diseases. Diagnostic difficulties have been thrown into focus, because diagnosis has assumed practical importance since the rôle played by the Rh factor has led to advances in treatment which permit the saving of many children.[10] The normal new-born infant has only 2,000 to 10,000 erythroblasts per c.mm., in its blood, while the baby with erythroblastosis may have 20,000 to 100,000. The normal hæmoglobin is over 100% with a red cell count of 5,000,000 to 6,000,000. With hæmolytic anæmia, the former may fall as low as 20% and the latter

TABLE IV.

DIFFERENTIAL DIAGNOSIS IN LIVE BORN INFANTS

	Fetal erythroblastosis	*Congenital syphilis*	*Antenatal infection*	*Postnatal infection*	*Hæmorrhagic disease of newborn*	*Congenital malformation of bile ducts*	*Congenital malformation of heart*	*Icterus neonatorum*
Familial incidence	++	++	—	—	—	—	—	—
Splenomegaly	++	++	+	—	—	++	+	—
Hepatomegaly	++	++	—	—	—	++	+	—
Anæmia	++	++	++	—	±	—	—	—
Leukocytosis	++	++	++	+	—	—	—	—
Leukæmoid blood picture	++	++	++	+	—	—	—	—
Erythroblastæmia*	++	++	+	—	—	—	+	—
Icterus gravis†	++	++	++	—	—	++	—	—
High icterus index	++	++	+	—	—	++	—	+
Indirect van den Bergh reaction	++	++	+	—	—	—	—	+
Biphasic van den Bergh reaction	++	++	+	—	—	++	—	—
Bile in urine	++	++	+	—	—	++	—	—
Urobilin in urine	++	++	++	++	++	—	++	++
Purpura	++	++	++	—	++	++	—	—
Œdema, general	±	±	—	—	—	—	—	—
Œdema, local	+	+	—	—	—	—	—	—
Enlarged placenta‡	+	++	—	—	—	—	—	—
Extramedullary hæmatopoiesis (at term)	++	++	+	—	—	—	+	—
Hepatic biliary stasis	++	++	+	—	—	+	—	—
Hepatic damage	++	++	+	—	—	+	—	—
Hæmosiderosis	++	++	+	—	—	—	—	—
Positive tests for syphilis	—	++	—	—	—	—	—	—
Father Rh+, mother Rh—, baby Rh+	++ in 90%	—	—	—	—	—	—	—
Anti R'r agglutinins in mother's blood	++	—	—	—	—	—	—	—

*Erythroblastæmia is used to indicate presence of immature nucleated red blood cells in circulation in excess of 1,000 per cubic millimetre.

†Icterus gravis is used to mean severe jaundice present at birth or within 48 hours after birth and lasting beyond the first week of life.

‡Average weight of normal placenta is about one-seventh of body weight.

++ indicates frequent occurrence; + occasional occurrence; ± uncommon occurrence; — indicates absence as a rule.

to 1,000,000. As for the differential diagnosis, all other diseases causing jaundice give rise to this symptom much later in the new-born period and without erythroblastosis. Congenital syphilis must be ruled out as it may produce all of the signs of erythroblastosis. New-born infants are relatively free of congenital hæmolytic icterus, but if it occurs, the presence of spherocytes, with an increase of the reticulocytes and the fragility of the cells will differentiate it. Erythroblastic anæmia or Mediterranean anæmia occurs sometimes in the new-born. The race factor, and the blood picture of a hypochromic macrocytosis with a leucocytosis will distinguish it. Acute hæmolytic anæmia, or Lederer's anæmia, purpura, hæmophilia and leukæmia are very rare in the new-born. The severe bleeding of hæmorrhagic disease may produce a marked anæmia, but the liver, spleen are not enlarged, and there is usually evidence of hæmorrhage.

The prognosis of this disease has improved greatly since we have understood the pathogenesis, and have treated it with the transfusion of Rh negative blood. The mortality has dropped from 71 to 14%. If the mother has once been immunized and produced an affected child, she carries the anti-agglutinins in her blood for life, and all future children will be affected, unless the father is heterozygous, when only 50% of the children will have the disease. If one of the surviving children is Rh negative, or if the father's father or brothers are negative, this latter condition may be assumed, or the father can now be tested for the negative factor. If the father is homozygous, no further pregnancies are advised, but, if the parents still desire children, artificial insemination from an Rh negative male is their only recourse. If there is a history of previous miscarriages (those under 28 weeks are not likely due to Rh hæmolysis) or still births, or babies born with jaundice and dying soon after, and if the mother is again pregnant, preparation can be made for immediate treatment of the baby with transfusions of Rh negative blood and the outlook is

excellent as a result of improved treatment. The testing of all mates or prospective mates would be ideal and may become a routine procedure, but at present is not practicable as testing material is not available. It is a question whether the parents should be told on account of the additional worry involved. Until the permeability of the placenta can be prevented, there is nothing to be done to prevent the disease. The value of terminating pregnancies earlier with the idea of shortening the period of intrauterine destruction is still to be determined. At Chicago, it has been proved that nothing can be gained by premature delivery. Prematurity added to erythroblastosis creates an additional hazard. Other incompatibilities between man and wife are more hazardous than differences in the Rh factor. The Chinese race, much older than ours, has a 99% rate of Rh positives in its population as compared with 85% in ours. It is calculated that it will take us thousands of years to reach this percentage.

Transfusion repeated as often as necessary is the only treatment for these infants. Intramuscular blood, which we used so confidently years ago is of no value whatsoever. Immediate action is necessary and Rh negative blood only must be used. The donors which will be more likely found among the mother's relatives, should not have been previously transfused, or recently pregnant, and their blood should be free of anti-Rh agglutinins. Group IV(O) blood can be given safely to any infant. The amount of blood to be given can be calculated from the percentage of hæmoglobin to be raised divided by 100 multiplied by the total volume of blood (Table V) estimating the latter as 40 c.c. to

TABLE V.

CALCULATION OF AMOUNT OF BLOOD TO BE TRANSFUSED

$$\frac{100 - \text{Hb\% of blood}}{100} \times \text{Total vol. of blood}$$

the pound, or we can give the baby 10 to 15 c.c. or even 20 c.c. of blood per pound of body weight, at a rate of 1 c.c. or more each minute. Observation of the hæmoglobin level or the red cell count, which is more reliable in the presence of jaundice, determines when more blood is needed. After two weeks Rh positive blood may be used, if the anæmia persists. The response is usually dramatic and by the end of the first week the baby should be well on the road to recovery. Treatment should include 5% glucose solution for the dehydration, and vitamin K for the hæmorrhage. It follows from the above that all maternity hospitals should have facilities for the testing for the Rh factors, and should also have a list of negative donors available at all times. Definitions of Rh are shown in Table VI.

TABLE VI.

RH DEFINITIONS

Rh Antigens, (5):—Rh_1, Rh_2, Rh′, Rh″, Rh_0.
Rh Blood Types, (8):—Rh_1 (54%), Rh_2 (15%), Rh_1Rh_2 (13%), Rh_0 (2.5%), Rh′Rh″ (1-10000) Rh′ (1.2%), Rh″ (0.3%), Rh Neg. (13.5%), Rh_y (rare)
Rh Agglutinins:—Anti-Rh_0 (85%), Anti-Rh′ (70%), Anti-Rh″ (30%)
Rh Factors:—Rh_0, Rh′, Rh″, Hr or St.
Rh Allelomorphic Genes:—Rh_0, Rh_1, Rh_2, Rh′, Rh″, rh.

SUMMARY

1. Anæmia of the new-born is not common but when it occurs it requires immediate treatment.

2. It may be associated with hæmorrhage, infection, prematurity and hæmolysis.

3. The problem of the control of hæmorrhage due to hypoprothrombinæmia has been practically solved by the prophylactic and curative use of vitamin K, and as a result there should be no fatalities arising from this cause.

4. The anæmia of infection responds to frequent transfusions while that of prematurity tends to improve spontaneously provided the nutrition of the infant is good. Iron is not of much value in these anæmias.

5. The discovery of the Rh factor and of its relation to the pathogenesis of erythroblastosis has cleared away the mystery of hæmolytic disease. Until recent times, 5% of the total fetal mortality was due to erythroblastosis, a greater cause than that of congenital syphilis. The use of Rh negative blood is saving the lives of these infants and has reduced the death rate from 71 to 14%. It is therefore imperative for all maternity hospitals to have Rh negative blood donors available at all times.

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AN EPIDEMIC OF ACUTE LARYNGO-TRACHEO-BRONCHITIS

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LATE in December, 1944, acute laryngo-tracheo-bronchitis became prevalent in Ottawa. It rapidly reached epidemic proportions, persisted unabated for 2½ months, then gradually burned itself out. Nothing like it had ever been experienced in the recollection of practising physicians. It was critical enough to receive considerable attention from the local press, which publicity only increased the apprehension of Ottawa mothers.

The first three cases admitted to the Ottawa Civic Hospital died. These infants were all seen early. The first, aged 20 months, was admitted with considerable respiratory distress, eight hours after onset of symptoms. He died suddenly 24 hours later, while being prepared for tracheotomy. He had received 30 grains of soluthiazole on admission and then 15 grains every 4 hours. Penicillin was started when his condition did not improve, but only 30,000 units were administered before death occurred. He was given hypertonic plasma and intravenous glucose. His temperature rose to 107 degrees and death seemed to be due as much to toxæmia as to asphyxia.

The second and third cases, aged 2 years and 1½ years respectively, were admitted three days following onset, having shown no response to adequate sulfonamide therapy at home. On admission, penicillin was administered, 25,000 units every 3 hours to the first, and 15,000 units every 3 hours to the second. Sulfonamides were continued in both instances. Tracheotomy tubes were inserted on admission in both cases. These tubes were changed frequently, the trachea aspirated by suction as necessary, usually with a catheter, but occasionally through a bronchoscope. Penicillin was instilled into the trachea frequently. Despite all these procedures, the infants died, the first 5 days and the second 2 days after admission.

This experience with our first three cases demanded our immediate action. A meeting of the Pædiatric and Oto-laryngological departments was held, to which were invited the bacteriologists of the Laboratory of Hygiene (including the virus division) of the Department of National Health and Welfare. The object of this meeting was to draft a plan for investigating the etiology of acute laryngo-tracheo-bronchitis, and also to revise our treatment.

We all were of the opinion that a virus origin was at least possible. This conclusion was based on two facts. First, there were colds present in other members of the family in most cases that had come under our care, and yet almost invariably, the child with acute laryngo-tracheitis had had a sudden onset of croup with no preceding rhinitis. This seemed to suggest that the acute laryngo-tracheitis was a primary condition, and not due to a secondary invading organism. Second, the poor response to both sulfonamides and penicillin, even in large doses, supported a virus rather than a bacterial etiology.

It was decided, therefore, to investigate subsequent cases for virus infection. Tracheal secretions taken at the time of tracheotomy, and post-nasal secretions from other patients obtained through a West tube, within 24 hours of onset of symptoms, were instilled intranasally into the usual laboratory animals. Due to lack of facilities, egg and ferret inoculations were omitted. For the same reason, *in vivo* and *in vitro* tests for the determination of changes in antibody level due to influenza A. and B. viruses were not attempted. However, 17 specimens of secretions failed to reveal the presence of a virus. This, while disappointing, does not entirely disprove our theory of a virus origin.

Unfortunately, further investigation received very little attention, partially due to a lack of hospital laboratory personnel. Tracheal secretions were cultured in four cases. Two were positive for *Staph. aureus* and non-hæmolytic strep.: one for *Staph. albus*, and one for hæmolytic *Staph. aureus*. White blood cell counts were recorded in 17 children. Ten were over 10,000, three of which showed definite evidence of secondary infections (otitis media and pneumonia). Seven had counts under 10,000 ranging as low as 2,800. Chest x-rays were taken in 8 cases. One showed some irregular congestion, and another a definite pneumonia. The remaining six, including one of those that died, were essentially negative. No further deaths occurred in our series of 103 cases.

As to treatment, the following plan was evolved and put into immediate effect. Enough humidifiers of the fan and wick type were installed in two four-bed wards to produce a cool

atmosphere with a humidity of at least 75%. All cases, private and public, were admitted to these wards.

Teams of special nurses were trained in post-tracheotomy care and placed in these rooms. The expense of these nurses was borne partly by the private patients and the rest by the hospital, so that at all times there were at least two nurses, usually three, and occasionally four, in each four-bed room. Group nursing has not been adopted in Ottawa. However, in treating these seriously-ill youngsters, it was found that during periods of extreme restlessness, associated with respiratory distress, it was often impossible for one nurse to restrain the child, change and aspirate tubes, and call for a doctor, all at one time, so that team work was essential for the efficient care of the patient. Also, when the handling of these sudden, and at times alarming emergencies was the responsibility of one nurse, her apprehension and concern was invariably reflected in her behaviour. It was too difficult for her to maintain that outward calm which is so essential in reassuring and lessening the panic in a child struggling for air. And so it was noticed that with a team of nurses in the room, there was a definite improvement in morale on the part of both nurses and patients.

Coupled in importance with the nursing care was the service of the oto-laryngologists. Tracheotomies and the maintenance of an adequate airway were their responsibility. The insertion of a tube into the trachea was usually delayed until other therapy had failed. The general indications necessitating this procedure were: persistent cyanosis or ashy pallor; marked respiratory difficulty—so-called laryngeal dyspnœa; evidence of fatigue. Although a large number of the cases were potential tracheotomies, it was found necessary to put tubes into only 11 of the 103 children admitted to hospital. The age of these varied from 7 months to 7 years. The last tracheotomy was in the 49th admission, evidence of a diminution in virulence as the epidemic progressed. It was felt that one of our fatalities could have been averted if an oto-laryngologist had been present at the time the respiratory obstruction caused death. With this in mind, it was decided that, when alarming cases were in the hospital, some member of the nose and throat department should be in constant attendance. An adjacent room was assigned to this department, and one of their staff remained in residence during critical periods. To this routine, we credited a great part of our success in reducing the mortality rate.

Despite frequent changing of tubes (every one to three hours at times) and aspiration with suction, bronchoscopic removal of tenacious secretions was found necessary in most cases to keep open a satisfactory air-way: and at times, this was an emergency procedure. Trays with laryngoscopes, bronchoscopes, bronchoscopic forceps, emergency tracheotomy sets, duplicate tubes, etc., were maintained in the room constantly, as were portable suction machines and oxygen tanks. Following tracheotomies, the patients were usually kept flat. Postural drainage seemed impractical and valueless. Inner tubes were changed every one to three hours, and outer tubes every 12 to 24 hours. Interns and nurses were trained to change outer tubes in emergencies. Tubes were permanently removed as soon as possible, usually between the third and eighth days. In an effort to soften the tracheal and bronchial secretions, saline or 5% soda bicarbonate was instilled frequently through the tube and then aspirated. Penicillin was instilled in the same way in most cases, but no apparent improvement could be attributed to its use.

Penicillin was given intramuscularly to 12 of the 103 cases, including the first three that died, the dose varying from 80,000 to 200,000 units daily. It was our impression that it had very little effect on the course of the illness. All but 11 children received sulfonamides, including all those that were having penicillin. The 11 cases that received no therapy other than cool humidity and nursing care compared favourably with the others, both in duration and severity of the disease.

All those not immunized for diphtheria, and three that were, received 20,000 units of antitoxin, without apparent benefit. Hypertonic plasma was used occasionally, but opinions differed on its efficacy in reducing the dyspnœa. Sedatives were administered sparingly for restlessness, when not associated with too much respiratory distress. Administration of fluids was considered essential, and an adequate intake was maintained by mouth if possible, or parenterally if necessary.

Other treatments which seemed to have little, if any, merit were bismuth suppositories, cough mixtures (expectorant and sedative, and including calcidin), potassium iodide, ice collars and

synapisms. All treatments and medication were grouped to disturb the patient as infrequently as possible.

In evaluating treatment, it seemed to us that the nursing and oto-laryngological services were of first importance; that cool air with a humidity of 75% was particularly beneficial; that adequate fluid intake was important; that hypertonic plasma was of doubtful value; and that penicillin and sulfonamides, while indicated because of the seriousness of the disease, were very disappointing in altering the course.

NASAL MEDICATION IN SINUSITIS*

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IN the light of recent knowledge, nasal medication in upper respiratory infections has undergone a change in the past few years. Greater interest has been stimulated in this subject due in great measure to the contributions of Proetz,[1] Hilding,[2] Lierle and Moore,[3] Walsh and Cannon.[4] When Proetz introduced his displacement method in 1926, the diagnosis and treatment of sinusitis was placed on an entirely new level. He showed how simply fluid could enter the sinuses by posture and intermittent suction. A few years later, Hilding demonstrated the direction and flow of mucus through the nose and its relation to ciliary activity.

Following these important advances Lierle and Moore pointed out that ephedrine, up to 3% in normal saline caused no damage to the cilia or to the epithelium of the nasal mucosa. They also demonstrated the harmful effects on the mucous membrane of nearly all the drugs used in sprays and droppers, including adrenalin, cocaine, silver salts and volatile oils. Even tap water and distilled water caused a definite slowing of the ciliary beat when applied to the mucous membrane of the upper respiratory tract. Seven years ago, Walsh and Cannon drew attention to the fact that many nasal drops or sprays caused permanent damage to lung tissue. They also showed that on aspiration silver salt preparations were more harmful to bronchial epithelium than mineral oil. On the nasal mucous membrane they also have an irritating effect in all probability due to their high alkaline pH value. Although 10% silver solutions do not appear to injure the cilia of the nose, they tend to upset the normal flow of mucus. This is thought to be due to the clumping effect of the precipitated silver protein which interferes with ciliary movement.

Mineral oil preparations containing menthol, eucalyptol and camphor have been prescribed by the medical profession for years in the belief that they clear the head. This was disproved by Fox[5] who showed that solutions as weak as 1% produce a swelling of the mucous membrane which reduces the volume of air through the nose to about one-half. Although there is a sensation of increased patency, this is not actually the case. Since it has been shown that oily solutions containing 5% menthol, eucalyptol and camphor sprayed into the nose daily have a definitely destructive effect on nasal mucosa,[6] their popularity has waned.

Liquid paraffin as a base for nasal medication does not actually reach the cilia but remains on the surface of the layer of mucus.[7] Although it does not cause any chemical harm, oil does not mix with mucus but lies as a heavy blanket on the mucous membrane and by its weight alone interferes with ciliary movement. The danger of pneumonia following the instillation of oily drops in children has also become recognized.

In view of these findings the trend in recent years has been toward nasal medication which does not disturb the normal physiology of the nose. One of the most important physio-chemical properties of nasal secretion appears to be its hydrogen ion concentrations. Eleven years ago Tweedie[8] attempted to show the relation of the bacterial flora of the nose to the pH value of nasal mucus. He found that in all patients in whom the pH value was 6.5 or below, that is slightly acid, cultures from the nose were negative. In the presence of inflammation when the pH was raised to the alkaline side, that is, above pH 7, organisms were usually found. From this he concludes that an acid reaction is inhibitory to the growth of pathogenic bacteria. According to Negus,[9] the beat of nasal cilia is

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greatly increased in an alkaline medium but is slowed down when the pH of the nose is acid—6.4 or less.

Four years ago Fabricant[10, 11, 12] emphasized the importance of the pH value in the treatment of nasal infections. He devised a method of obtaining pH readings of nasal secretions *in situ*. Previous to this, mucus was collected in containers and when exposed to the air underwent changes which made the readings inaccurate. As a result of his findings, Fabricant noted clinically that in normal cases the nasal pH varied from 5.5 to 6.5. This is slightly lower than the estimates obtained by the above older methods. Nungester and Atkinson[13] reported a somewhat different method of estimating the pH of nasal mucosa *in situ* and their readings were slightly higher. According to their findings, the normal pH is 6.6 to 7.6 and that patients with acute rhinitis have exactly the same pH value. They concluded that the mean pH value in the common cold is essentially that of the normal nasal mucosa.

Recently Parkinson[14] attempted to explain the evident confusion in the results for the determination of intranasal pH. He stated that within the nasal chambers are two distinct sources of hydrogen ion concentration: living tissue, that is nasal mucous membrane, and non-living secretion or nasal mucus. Living nasal mucosa under the control of body mechanisms contains fluid which maintains standard physical properties. On the other hand, nasal secretion while derived from body fluid is non-living and is neither standard or constant. "Thus there are in contiguity two intranasal fluids: body fluid within the tissue with physical characteristics controlled and constant, and secretion on the tissue surface with values uncontrolled and ever-changing."

An intranasal electrode lies in contact with the nasal mucous membrane and nasal secretion so that the pH determinations *in situ* give the combined hydrogen ion value of nasal mucosa and nasal secretion. Apparently it seems impractical at present to make separate readings, so that the term intranasal pH would appear sufficient. It is hoped that in the near future with improved methods more uniform findings will result.

The pH value depends on a number of factors. Temperature changes influence it. For instance, cold tends to make the secretion alkaline while heat causes a drift towards acidity. During an acute cold or sinusitis as well as in the presence of an allergic attack the pH readings of nasal secretions are high, *i.e.*, alkaline. These facts are borne out by Hilding[15] who found that the pH became more alkaline during the first four days of an acute head cold. Buhrmester[16] also noted that secretion from patients suffering from nasal allergy were as a rule highly alkaline.

Nasal pH also varies with rest and sleep and throughout the day. Rest in bed and sleep tend to produce an acid reaction in nasal pH and this is more marked at night than during the day. Atlhough it is sometimes difficult to persuade a patient in the early stages of an acute rhinitis or sinusitis to remain in bed, theoretically this appears to be sound advice. Apart from the danger of spreading the infection, rest and heat alone tend to reduce the high alkalinity of the nasal secretion to the normal slightly acid level.

Considering that the vast majority of acute sinus infections, excluding allergy, originate from the common cold, the early treatment of this condition is important. The organisms most frequently found in the nose during an acute coryza or nasopharyngitis are the beta hæmolytic streptococci, pneumococci, and *H. influenzæ*, although the predominating organism varies from year to year.[17] Fortunately from a rhinologist's point of view, the secondary invaders which produce sinusitis and ear complications—streptococci, staphylococci and pneumococci — are controlled by chemotherapy.

In view of the miraculous results obtained with the sulfonamides by mouth and intravenously in cases of pneumonia, septicæmia, streptococcic infections, etc., it was thought that locally they would be just as effective. In open wounds, such as operative fields, sulfonamide powder or solution on dressings seems beneficial. The local use of sulfonamides in the nose in powder form or in solution combined with vasoconstrictors has been tried with varying success. With an intact nasal mucous membrane, it is doubtful whether the sulfonamides have sufficient bacteriostatic action to be effective. The absorption into the blood stream from an inflamed but intact mucous membrane is also very limited.

A series of cases of acute sinusitis were treated by nasal instillations of 5% sulfathiazole

three times a day for a ten-day period. Blood levels were then taken but it seemed impossible to raise the concentration above 0.5 mgm. %.

Since the advent of the sulfonamides, various reports have appeared in the literature concerning their therapeutic value in acute and subacute rhinitis and sinusitis. According to Livingston[18] oral sulfonamide therapy in acute nasal sinusitis is as effective as in cases of acute otitic infections. "In conjunction with other indicated measures, sulfonamides usually effect quicker relief, a shorter course, and less tendency to complications than when not used." Concerning the local effect of the sulfonamides in the nose, opinions at present vary considerably. Many writers recommend the sulfa compounds combined with a mild shrinking agent in an isotonic solution, and are enthusiastic over their results. Others are equally satisfied with a weak vasoconstrictor in normal saline without any added medication as long as ventilation and drainage are maintained. In a recent article on the local use of sulfa solution in the nose, Whalen[19] concluded that the beneficial results were due more to the accompanying vasoconstrictors than the sulfonamides. Since it has been shown that certain of the salts of sulfathiazole, particularly sodium, have a deleterious effect on the cilia and nasal mucous membrane even in concentrations as low as 5%,[20] there has been a tendency to use sulfonamide solutions of 2 and 3%. Powdered sulfathiazole, sulfadiazine and the microcrystals in 5% saline solutions do not appear to exert any destructive action on the cilia or nasal mucosa. However, in the light of our present knowledge, it seems reasonable to assume that solutions for nasal medication should be isotonic, slightly acid, that is with a pH between 5.5 and 6.5 and not interfere with ciliary activity or injure the mucous membrane.

There appears to be a difference of opinion in applying solutions to the nose. Recently Butler and Ivy[21] described the methods and merits of nasal medication. They compared nose drops with sprays and volatile inhalers and concluded that, "the effects on the nasal mucosa produced by repeated administration of inhalers and sprays are similar, and both produced far less pathological change than that resulting from the use of nasal drops." By means of the inhaler and spray a thin layer of the drug is spread over a greater area of mucous membrane and is therefore more effective in reducing nasal obstruction. However, in acute cases where the turbinates are inflamed and swollen, it is doubtful whether solutions from nasal sprays reach the ostia of the sinuses.

On the other hand, unless instructions are given by the surgeon, nose drops applied by patients usually spread over the lower half of the nose and do not enter the middle and superior meatuses where shrinkage is important. In this way certain localized areas are blanched by vasoconstrictors especially on the inferior turbinates and if this is repeated over long periods, destructive changes occur which lead to permanent damage of the mucous membrane.

Now that penicillin is available for civilian use, it opens a new field to the otolaryngologist. Since the discovery of the antibacterial properties of penicillin and gramicidin, a by-product of tyrothricin obtained from soil bacteria, great strides have been made.

These two preparations have distinct advantages over the sulfonamides with few disadvantages. Gramicidin as the name suggests is effective against many Gram-positive organisms such as pneumococcus and some forms of streptococcus and staphylococcus. Gram-negative organisms such as *B. Friedlander* and *H. influenzæ, B. coli* and *B. proteus* are not acted upon by the mould. However, gramicidin has certain limitations, as it is toxic when injected intramuscularly or intravenously and must be used as a topical application. It is insoluble in water and as it is not absorbed it must be in direct contact with organisms to be at all effective. It comes in sealed ampoules, in stable form, so that a 2% solution is readily made up (8 minims to one ounce of distilled water). This solution remains active for at least three weeks and is said to be effective when used in nose drops, spray or displacement where the offending organism is sensitive to gramicidin.

In using gramicidin (tyrothricin) and penicillin, accurate bacteriological findings are of paramount importance. For instance, certain strains of pneumococcus, streptococcus and staphylococcus pyogenes are not acted upon by gramicidin but are sensitive to penicillin or the sulfonamides. At times it is necessary to use a combination of two or all three to destroy a Gram-positive infection. Some aerobic and anaerobic streptococci and pneumococci are affected by tyrothricin while certain types of staphylococci are resistant. Many of these are peni-

cillin-sensitive but in the same way some are not in the least influenced by penicillin.

Repeated cultures and the importance of the rhinologist and bacteriologist working together at once becomes self-evident.

Penicillin on the other hand has a wider range of usefulness against Gram-positive organisms without the disagreeable side effects of the sulfonamides. It is soluble in water, is quite innocuous even in large doses, and can be used locally or given intramuscularly, intravenously or intrathecally. Recently it has successfully been given by mouth. In the proper dilution it is non-irritating to mucous membrane and does not injure the ciliated epithelium of the nose. Various writers have stressed the fact that solutions of penicillin must be fresh, that they lose their effectiveness after a week or ten days and that they should be kept in the ice-box. Experience with penicillin by the displacement method in the nose for the past year has given remarkably good results. During that time, we have on many occasions kept solutions for over two weeks—often at room temperature—and still found them potent to destroy *Strep. hæmolyticus,* according to the bacteriologist. This is important, as it is not always convenient to procure fresh solutions every few days and some forms of streptococci are very resistant, requiring the continuous action of penicillin for at least ten days to be effective. This has been shown in cases of closed abscess cavities where it is possible to maintain a high penicillin concentration. The time required to sterilize pus varies, depending on the causative organism. For instance, the pneumococcus is very sensitive and is destroyed in about forty-eight hours. About the same time is necessary to kill *Strep. hæmolyticus.* On the other hand, *Staph. pyogenes* is more resistant, as it requires ten days to two weeks in order to free a cavity of this infection. Two other organisms might be mentioned although they are rarely found in the nose. The meningococcus and gonococcus are very sensitive to penicillin and are easily destroyed in thirty-six to forty-eight hours. This time factor is very important as the length of treatment is influenced by the predominating organism present in the nose.

According to Proetz fluid instilled into the nose by the displacement method remains in the sinuses from twenty-four to ninety-six hours or longer, depending upon the distribution of the cells, the position of the ostia, the viscosity of the fluid, etc. We have had excellent results using penicillin by the displacement method every forty-eight hours for four, six, eight or ten treatments, depending upon the offending organism reported by the bacteriologist.

The following case indicates the efficacy of this form of therapy:

A man of 61 reported to his physician concerning a severe cough which had persisted for nearly six months. At times he would be seized by a sudden spasm and feel so distressed that he seemed unable to breathe. The results of the general physical examination proved negative, but a roentgenogram of the chest showed some aneurysmal dilatation of the arch of the aorta. The aneurysm was not considered sufficient to account for the cough, and he was referred for an otolaryngological consultation. Examination of the ears revealed no abnormality and hearing was normal on the two sides. The nose showed a mild degree of reddening of the mucous membrane but no evidence of pus or polypi. The septum was in the midline, and on transillumination, the sinuses appeared equally clear throughout. According to his past history, there were no indications of frequent colds or sinusitis, although the roentgenogram showed a slightly thickened lining of the left antrum, the other sinuses being clear. The pharynx and nasopharynx were normal, but the larynx showed a definite lagging of the left vocal cord, the right moving freely. Material taken from the middle meatus of each side and the nasopharynx on swabs produced a heavy growth of *Staph. aureus* in pure culture on three occasions. Staphylococcus toxoid and autogenous vaccines gave severe local reactions but did not influence the cough. The patient became slightly anæmic and began to tire easily, partly from the coughing spasms but also, it was thought, from the low-grade infection present.

On reviewing the case two facts seemed important. There was constant mild inflammation of the nasal mucous membrane, and repeated cultures of material from the middle meatus on each side and from the nasopharynx showed a heavy growth of *Staph. aureus,* practically in pure culture.

It was decided to use penicillin locally in the nose, as this seemed to be the source of infection. However, when nasal medication is accomplished by means of a dropper with the head in the dependent position, the drug used disappears into the nasopharynx within a few minutes and therefore loses its effect quickly. In contrast, fluid instilled into the sinuses by displacing the air remains, as a rule, for one to three days. It was therefore decided to try the displacement method in order that the drug might remain in the sinuses as long as possible. A penicillin salt was dissolved in sterile isotonic solution of sodium chloride to a strength of 10,000 units of the active substance per cubic centimetre. This solution was kept in rubber-capped bottles in the ice-box. After the patient's nose had been sprayed and the mucosa shrunk with a 5 to 8% solution of cocaine hydrochloride, he was placed on a table with his head hyperextended over the edge as described by Proetz. He was then asked to roll slightly on his side with the nose turned upward so the fluid could not run out. A sterile nasal dropper was filled three times with the solution of penicillin and emptied into the lower nostril. The dropper held 1 c.c., hence 3 c.c. was used. Intermittent negative pressure from a rotary pump was applied to the lower nostril through an olive tip while a finger closed the upper nostril. The patient was instructed to repeat the letter K in order to close the pharynx. After applying alternate suction ten or twelve times to displace the air and get the solution into the sinuses, another dropperful or two were instilled and the suction repeated. The head was then turned to the other side and the other nostril treated in the same way. The whole procedure required only a minute or two.

On returning to the upright position, the patient noticed little taste, the solution of necessity being in the sinuses. He was cautioned against blowing his nose for at least an hour or two.

This procedure was repeated on four occasions at forty-eight hour intervals, and two days later material was taken with swabs and cultured. Forty-eight hours between treatments was considered sufficient, as previous roentgen films showed iodized poppy seed oil 40% to be retained in the sinuses for at least that length of time. On examining the cultures, to our surprise we found that the left side was free of organisms but that a few colonies of staphylococcus appeared on the plate inoculated with material from the right middle meatus.

There was still a heavy growth in pure culture on the plate inoculated with material from the nasopharynx. Displacement was again carried out on four occasions at forty-eight hour intervals. On the last two occasions, the head was hyperextended but kept in the midline in order to fill the posterior cells of the ethmoid and the sphenoid sinus as well as the nasopharynx.

This time cultures of material from the right and left middle meatuses were sterile but there were still a few colonies of staphylococci on the plate inoculated with material from the nasopharynx. In the meantime the patient reported that the severe paroxysms of cough had completely disappeared; he was eating and sleeping better and his general condition was greatly improved. A third series of four treatments was given in the same way as the first, and the cultures made four days later of material from both middle meatuses and the nasopharynx proved to be sterile.

One or two points that were brought out in this case should be mentioned. Although the nose was cocainized well with a 5 to 8% solution, the patient complained of a burning discomfort which involved the nose and the eyes. This lasted for an hour or so after each treatment and has been mentioned by other writers who reported cases in which penicillin was used locally in wounds. A solution of a penicillin salt in 1% solution of tetracaine hydrochloride was made up and found to be satisfactory. The anæsthetic effect of tetracaine does not in any way interfere with the action of penicillin. The patient at once remarked on the diminished irritation, as have other patients treated more recently in a similar manner.

There might be some criticism of the shrinking of the nasal mucous membrane with a 5 to 8% solution of cocaine on account of the subsequent engorgement with narrowing of the ostiums of the sinuses. This we considered beneficial, as the solution containing penicillin was thereby retained in these cavities for a longer period.

In the case here reported dramatic results were seen from this form of treatment, which convincingly substantiates the opinion that a low-grade infection was one of the determining factors in the production of the cough. It will be interesting to observe whether subsequent infections of the upper respiratory tract again initiate the cough.

Since such a striking improvement was witnessed in this patient, many others have been treated in the same way. In young children as well as in elderly adults, the results have been equally good. Sinus infections in which the offending organism was pneumococcus, streptococcus or *Staph. pyogenes* and which were not complicated with allergic manifestations have responded readily to this form of treatment. A recent case of low-grade sinusitis in a boy of ten years caused by *Neisseria catarrhalis* cleared up after penicillin had been introduced into the sinuses on four occasions by the displacement method. Material on a swab taken from the middle meatus gave a profuse growth of this organism, almost in pure culture. We have been unable to find in the literature any reference to penicillin acting on *N. catarrhalis*, but basing our therapy on the close resemblance of this organism to the gonococcus and the meningococcus, we tried it, with gratifying results. Thus we have in penicillin an agent which is nontoxic, is isotonic, is slightly acid with a pH of 6.5, which does not interfere with ciliary streaming and does not injure the nasal mucous membrane.

Contrary to the suggestion of Garrod,[22] there is no clinical evidence whatever that overdosage with penicillin either systemically or topically has ever been observed.

Fortunately for the rhinologist, a great proportion of the infections of the upper respiratory tract involving the sinuses are caused by Gram-positive organisms and many of these respond to penicillin therapy.

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THREE PROBLEMS OF THE AMPUTEE

By Preston J. Burnham, M.D.

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THIS is a report of the solution of three problems in a lower leg amputation. The problems are:

1. Mechanical Difficulty, or Fit of the Socket

Altogether too many amputees prefer to get about on crutches while a potentially perfect prosthetic appliance stands at home in the closet. The usual history is that the patient has waited a length of time after operation deemed proper by the limb maker, in which he has shrunken his stump to a fairly constant size, then had the limb fitted to his stump. The cast of the stump was taken with the extremity either in horizontal or vertical position with soft tissues pendent or drawn tight with a stockinette.

This method of obtaining a cast is the best we can use, but there is much to be done thereafter in the fitting, especially in the thin, not-so-well padded individual, because the true fit is appreciated only when pressure is placed upon the stump in walking. This serves to iron out the soft tissues and allow the bony prominences (of which there are usually seven in the lower leg amputation) to stick out and irritate the skin to the point of ulceration.

To take the weight off these points, the leg maker grinds out the side of the socket at the place indicated, with a sander. All limb makers determine the spot to sand by placing some talcum powder on the reddened or abraded area, then putting the stump back in the socket with pressure. The talcum remains in the socket. The sander is a dowel-shaped rotating wooden tool with sandpaper wrapped about the end. This abrades a cylindrical hole in the side of the socket into which the bony protuberance falls, allowing the weight then to be borne on other sore points. It is obvious that no bony knob is ever cylindrical. The amputee, after a reasonable time of six months to a year of such treatments finally decides that he will never be able to wear a limb and discards it for the crutches. The crutches, he feels, are to be preferred to constant painful ulcerations of his stump.

2. Furunculosis or Pustule Formation

In the normal clear-skinned individual there is no area on the body where conditions are better suited for the invasion of the skin by pyogenic organisms than on the sides of a sweaty stump where the skin is softened by the moisture and the organisms are forced into the sweat glands and hair follicles by the individual's whole weight. In the patient with an acne diathesis, the chances for furunculosis are increased.

The pustule may take one of three courses. If discovered when roughly less than an eighth of an inch in diameter, properly prepared and drained, the chances are excellent for a crust to form that will not break down, and the lesion will heal while the leg is worn. On the other hand, if it is too large for a crust to remain in place under stress, the first few minutes of walking will force it off, and for the first few days new skin will be seen to form about the periphery.

But in four to five days of conditions of pressure and perspiration, the red granulations will be seen to take on a dead white appearance and to weep a clear serous fluid which forms only a thin crust when the leg is left off. It would seem that the lesion in this state will never heal under conditions of walking, for the patient in the case to be described had one such lesion less than three-sixteenths of an inch in diameter that did not heal in two months of walking, and only did so six weeks after the leg was left off. The only treatment of such lesions is to leave the leg off for a reasonable length of time then excise and close with sutures.

All the while that the lesion is draining in the limb, there are present the dangers of enlargement and infection. When a minor infection occurs, swelling of the lesion causes pain equal to that experienced in placing a marble in one's shoe. Swelling also pushes the stump about in the socket so that new pressure points are developed with ensuing ulceration.

The third course taken by furuncles of the stump is to form phlegma followed by their accompanying dangers.

3. Failure of the Skin to Toughen Up

The lower leg amputation through the tibia and fibula makes for weight to be borne on surfaces not so intended by nature. And the weight is not directly borne, but rather on the

sides of the stump in a cone-shaped socket wherein much friction occurs. Most people, even so, will form callus on these surfaces. Others, especially fair-skinned individuals, will not, but will continue time and again to rub off their skin.

CASE REPORT

The patient is a tall, thin male, six feet three inches tall, weight 150 pounds, 28 years of age, with a tendency to generalized acne who lost his leg finally in 1938 four inches below the patellar tendon insertion, after a three-year period which included five other amputations on the same limb and numerous long incisions which extended above the present amputation site for drainage of soft tissue infection. The stump was left with a 2 cm. wide scar adherent over the entire length of the fibula, and two longitudinal scars 1 x 8 cm. about the heads of the gastrocnemius, the proximal ends of which were within the rim of the prosthesis socket.

The stump was completely shrunken in some three months after final operation by application of Ace bandages, fairly rigorous manual massage, and gentle pummelling. The socket was made of the hard, waterproof laminated leather and fibre type which may readily be worked over to the true shape of the stump and not lose its form under stress. For the first six months, the stump was constantly ulcerated first on the scarred fibula, then on the other points and back again until the patient began to work the socket himself.

Suggested solution of the three problems:

1. Instead of the usual sander method, the patient used small squares of sandpaper held over the end of a finger. In removing leather from the socket, the cavity was constantly compared with the contour of the bone so that neither a smooth, saucer-shaped area, nor a cylindrical hole was scooped out, but rather, one that fitted the bone accurately. And the proper depth was not attained at any one operation lest it be too deep or irregular. Instead, he sanded out only a portion of the anticipated depth then waited a few days until the need for a deeper impression was obvious.

From time to time, areas that were not reddened and therefore not taking their proper share of the weight were mapped out on the skin. Chamois skin was cut to size, the edges skived, and stuck in place in the socket with ambroid or duco household cement. This was allowed to dry, then the surface was built up with two or three coats of cement with sanding in between applications in the same fashion that one finishes a maple table. In this fashion, a socket was developed that distributed the weight evenly throughout the surfaces of the stump and took none on the scars.

As regards the other two problems: For the first few years alcohols of various strengths were tried to toughen the stump and kill the bacteria. The furuncles were not vanquished, and the sensitive skin simply sloughed the more rapidly so that the skin became more abraded than without treatment. Cornstarch was tried, which is suggested by most leg makers, and zinc stearate powder, but these are not antiseptic, do not toughen the skin, and cake up the stump sock which in turn, hardens and loses its cushioning effect. Every few weeks the patient would have to rest and remove the limb for two or three days so that furuncles might heal. A clean sock every day, or even twice a day neither lessened the furuncles nor maintained a skin free from abrasions. The stump in all this while was washed each night with soap and water.

For the past year, however, he has used a solution of one pint of the ordinary hospital back-rubbing borated 70% alcohol mixture, 50 c.c. super-saturated solution of NaCl in water, and 25 mgm. of gentian violet crystals applied nightly after the soap and water scrub and allowed to dry.* In the morning, and before each change of stump sock, the stump was dusted with amolin powder (a proprietary personal deodorant preparation). Socks are put on clean every two or three days and changed only once a day in hot weather. No pustules have appeared to date, although the acne elsewhere on the body is unchanged; the skin on the stump is thicker and has not blistered in the hottest weather, although the patient is an intern.

COMMENT

The fitting of the socket to a sensitive thin-skinned stump may take months of slow, painstaking labour. It must, of necessity, be done slowly else craters will be made that will throw the whole fit of the socket off and the procedure be commenced anew. But the elements of time and labour are more than compensated for by the comfort of the well-fitting leg and the increased every-day efficiency of the leg wearer over one who walks on crutches. It is quite possible, too, to build up the resistance of the skin to the hard wear that is placed upon it by an artificial limb, as well prevent the appearance of crippling pustules.

It is hoped that a little intelligently applied labour upon the socket plus application of the alcohol solution and the powder will serve to rehabilitate those who "cannot wear a limb".

*In dry, cool weather when the skin became excessively dry, the salt solution was omitted.

TIETZE'S SYNDROME

By A. K. Geddes, M.D.*

Montreal

THIS is a report of 22 cases of non-suppurative, non-specific swelling of the rib cartilages, a condition that has received very little attention in the literature but which in the writer's experience is by no means rare in the Canadian Army.

The first reference in the literature to this syndrome is by Tietze, who in 1921 reported 4 cases observed by him in Germany in the immediate post-war period. Three were females, one male. Their ages ranged from 28 to 50 years. He described a swelling of the costal cartilages of unknown etiology, insidious in its onset, spontaneously painful, not associated with constitutional disturbance, and of prolonged, fluctuating course. One case was followed for over a year. Tietze suggested that he was dealing with a dystrophy of costal cartilage due to war-time malnutrition. From one case he removed the entire tumour mass and found the overlying soft tissues, perichondrium, muscles and fascia thickened but without any signs of inflammation on microscopic examination. The cartilage histologically, he reports, "Shows cartilaginous tissue, in irregular arrangement suggesting neoplasm, but without signs of malignancy, and showing patchy areas of calcium deposit and dissolution into fibres."

In 1923 Harttung described one case, with biopsy. At about the same time Froehlich reported one, and Kuettner in the discussion described another with biopsy. In 1937 from Japan came a report of 9 cases, all in malnourished women.

In August 1942, Gill, Jones and Pollack reported in the *British Medical Journal* five cases, one with biopsy, and pointed out for the first time, the association with respiratory tract infection. Obvious malnutrition was not a factor in these cases, but the authors state, "Qualitative changes of which we are ignorant may be of etiological significance."

In 1942, Wrench reported one case and in 1942 and 1943 two cases were mentioned in the correspondence columns of the *British Medical Journal*.

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The literature on disease of costal cartilages is meagre. Moschcowitz in 1918 states, "I have seen many cases of diseased costal cartilages, and with the exception of an occasional case of proved actinomycosis, practically all the remaining cases were regarded as tuberculosis."

Tuberculosis, typhoid, and pyogenic infection, in the order named, are considered the chief etiological agents in costal cartilage disease, with tumour reported only rarely, and fracture extremely rare, and syphilis rare. The blood supply to costal cartilages is poor, only that part directly contiguous to bone appearing to be vascularized in the age period from birth to 30 years. There is no cancellous substance and no Haversian canal system. The perichondrium produces chondrophytes but these do not grow into the cartilage.

In 1927, R. Davies-Colley in a paper on "Affections of the ribs" described myositic swellings about the costo-chondral junctions. He noted them most frequently about the third left costal cartilage where he considered them caused by trauma of pectoral muscle pull, and about the eighth and ninth costal cartilages, usually in thin women who were traumatized in that region by the pressure of table or workbench.

Some surgeons have told the writer that they have seen non-suppurative swollen costal cartilages surgically removed on the assumption that they were tuberculous.

Following the appearance of the paper by Gill, Jones and Pollack, I saw 8 cases in the autumn of 1942, 8 cases in the autumn and winter of 1943-44, and 13 cases in the autumn and winter of 1944-45. All were Canadian male soldiers in England, and each year the observations were made in a different area. Of the 30 cases seen, documents of the first group have been lost, leaving 22 documented cases for the basis of this report.

All the cases had a concomitant respiratory infection. In some the onset of the respiratory infection antedated the chest pain by periods up to one month; in other cases it was coincident; in still others the respiratory symptoms followed in one or two days. One case had an acute bronchitis; in the majority of the remainder the symptoms were those of a mild "cold", with only occasionally a severe cough. In the cases of long duration there was a marked tendency to recurrence of tenderness with each

fresh "cold." All the cases occurred in autumn and winter, the season of respiratory infections.

Trauma appears to be a negligible factor. In three cases there was a history of recent trauma to chest. A 26-year old lieutenant fell from his bicycle, breaking his fall with his right arm. The following morning he awoke with severe pain over the second right costal cartilage and noted a tumour there. Another patient had pain following trauma to the ziphoid, the pain disappearing some weeks after, and reappearing in the same area with a respiratory infection and swelling of seventh right costal cartilage. The third, a medical officer, attributed his second right costal cartilage pain to a kick from a Piat gun.

The age incidence varied from 19 to 40 years of age. All were well nourished or adequately nourished. None showed any constitutional disturbance and all were eating the Canadian Army diet without any known food idiosyncrasies.

There is little evidence in these cases of insidious onset. Many patients could name the day and sometimes the hour at which the costal pain was first noted, and all could locate the involved area with a finger-tip.

Four cases came from one Anti-Tank regiment; three cases came from one reinforcement unit; and two from one transport unit. This is the first reported instance of more than one case occurring in a given group. It is not necessary, however, to postulate further than that the attention of the respective regimental medical officers had been called to this syndrome on the appearance of his first case at the Hospital Consultation Clinic.

Four of the group were officers. Two additional officers were seen with costal cartilage pain and tenderness, but with no swelling, while under observation, and are not included in this series. All the cases presented here had costal cartilage swelling, pain, and tenderness associated with respiratory infection.

Altogether 28 cartilages were involved in the 22 patients. The second left costal cartilage was the most frequent, being involved alone in 6 cases, and together with the third and fourth in one case, and with the third in another. Next in frequency was the second right, involved 6 times independently and once along with the first right cartilage, and once along with the third. One patient showed swelling of the second, third, and fourth cartilage; another of the fourth, fifth, and sixth; one patient was seen with swelling and tenderness of the costal cartilage of the left tenth rib, and one with the tenth involved bilaterally. Apparently any costal cartilage may be involved.

The swelling varied from a slight firm enlargement sometimes seen in the early stages to a firm smooth or irregular mass obliterating the adjacent intercostal spaces.

Tenderness varied from mild to extreme. It is most marked at the onset, tending to diminish greatly after the first week or fortnight, weeks or months before the swelling regresses. In the presence of a swelling, however, tenderness reappears with each fresh respiratory infection. In two patients there was additional pain and tenderness over an uninvolved rib near the spine.

The following features are highly characteristic: aggravation of the pain on coughing, sneezing, deep breathing, or blowing the nose, and on lifting, bending, reaching, or torsion; inability to find a comfortable position in bed, inability to lie on the affected side, waking with pain on turning over in bed.

Fever to 99 deg. was observed in four cases. In four patients the tuberculin skin test with 0.1 mgm. of old tuberculin was negative. Kahn reactions were negative. Erythrocyte counts, white blood counts, differentials and hæmoglobin were normal. Erythrocyte sedimentation rates were normal except in a few cases where the respiratory infection was pronounced. X-rays of the lungs were normal in all cases. In one patient only was there any x-ray change in the thoracic cage. This patient was a 2 year old soldier whose ribs were normal on enlistment film and who two years later with a large swelling of the first and second right costal cartilages, showed on x-ray expansion and rarefactions of the anterior end of the first rib. It is not suggested that these rib changes are necessarily due to Tietze's syndrome.

The duration of symptoms prior to first visit varied from 3 days to 11 months. Four patients gave a history of more than five months. Several cases were observed over a period of months to apparent complete resolution. In the majority of cases, the tenderness disappears in a few weeks and the swelling in a few months, but some cases have a prolonged and fluctuating course, acute tenderness and pain supervening with recurrences of respiratory infection.

Treatment consists in the avoidance of undue exertion, and in the management of the associated respiratory infections.

Biopsy report.—In one patient with a large swelling of his second left costal cartilage, of two weeks' duration, a portion of the cartilage including its costal end was removed by Lieut.-Col. J. G. Shannon. He reported the cartilage and perichondrium swollen, but felt no swelling of other contiguous structures.

Lieut.-Col. R. A. H. MacKeen studied sections at three different levels from this specimen and reported, "The appearances here do not suggest a true neoplasm. There is a hyperplasia of the cartilage, some of which is fibrocartilage, particularly on the external aspect. In a few areas there is metaplasia of cartilage with early bone formation; in these areas there is an increase in vascularity. In other areas there is some calcification. In the bony portion, sectioned, there is fibrosis of the marrow. The perichondrium is thickened due to an increase in fibrous tissue. It is difficult to evaluate the varied picture seen but some areas suggest atypical callus formation. It does not appear to me to be a simple chrondroma."

SUMMARY

Twenty-two cases are reported (of a total of 30) of non-suppurative, non-specific, painful swellings of the costal cartilage, of unknown etiology, of variable and often prolonged and fluctuating course.

The disability produced is minor, not necessitating hospitalization, but may be very annoying, and in most cases necessitates light duty for weeks.

The cause is unknown. There is no reason to suspect dietary deficiency in any of these cases. The association with respiratory disease, which appears before, coincidentally with, or after the chest pain, in invariable. Exacerbations frequently occur with each bout of minor respiratory infection.

Four cases are reported from one unit.

Trauma appears not to be a factor of any importance. Tuberculosis and syphilis are ruled out.

This syndrome of non-suppurative, non-specific painful tender swellings of one or several costal cartilages, with little or no constitutional disturbance, associated with infection, usually upper respiratory infection, possibly always respiratory infection, appears to be a not uncommon cause of "chest" pain.

When men present themselves with thoracic pain—admittedly a difficult diagnostic field at times—the possibility of Tietze's syndrome should be borne in mind.

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RÉSUMÉ

Le syndrôme de Tietze consiste dans le gonflement de plusieurs cartilages costaux; ce gonflement n'est pas spécifique et ne suppure pas. Il ne s'accompagne pas de malaises généraux. Il détermine simplement un syndrôme thoracique douloureux dont l'élément essentiel est la douleur localisée. Ce syndrome est le plus souvent associé à une infection des voies respiratoires. La cause en est inconnue et l'évolution est variable. Le régime alimentaire n'a rien à voir avec son apparition. Les traumatismes, la syphilis et la tuberculose ne sont pas en cause. 22 cas ont été observés qui coincident avec la description de ce syndrôme, plus fréquent que l'on ne croit s'il est bien recherché. JEAN SAUCIER

INFECTIVE HEPATITIS*

By C. H. A. Walton,† M.Sc., M.D., F.A.C.P.

Winnipeg

INFECTIVE hepatitis has proved to be one of the most important diseases, at least numerically, affecting our armies, those of our allies and probably those of the enemy. The notable advances made in the study of its pathology during the last few years make it a timely subject for discussion. As I shall show later, this disease is probably synonymous with what we know as catarrhal jaundice. Although British troops suffered to a fairly large extent from this disease in the Middle East in the last war, it was uncommon in France. Accordingly, the Canadian Army suffered little.

In peace time and in civil life we are all familiar with a mild form of this disease and we all see occasional cases. My interest in it was not really aroused until I met it in my wards in England. In the three years that I served in that country some 130 cases went through the medical division. While this number was not large, representing only about 1% of our medical admissions, the disease was exceedingly interesting to us because of its severity.

* Read at a meeting of the Winnipeg Medical Society, January 19, 1945.

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There were two deaths from acute yellow atrophy and in a few other cases the severity of the illness and course suggested that they had at least a subacute yellow atrophy. One case developed frank cirrhosis and ascites within three months of the onset of his jaundice, and others gave us reason for some anxiety that a similar process was developing. When we reached the Mediterranean theatre we found in the first six weeks, *i.e.*, to the end of August, 1943, that we had the usual small but steady flow of cases, some twenty in all. However, in September, the number suddenly rose to 278 and in the ensuing eight-month period we admitted 1,900 cases of this disease. Since I have returned I have been informed that the admission rate continues at the same level. This large epidemic rate was experienced by all military hospitals in the theatre, British and American.

The disease was endemic in England and epidemic in the Central Mediterranean area. There were many reports of small epidemics among both soldiers and civilians in England but such epidemics never became widespread. Reinforcements coming from England rarely developed jaundice until six weeks after arrival, indicating the epidemic nature of the disease in Sicily and Italy. I do not know if it was widespread among the civilian population of Italy or Sicily but it undoubtedly existed. It appeared to be as common among prisoners of war both German and Italian. Although there were few women with us, many of them acquired the infection. Deaths were uncommon in the Central Mediterranean Forces and probably were less than 0.5%. However, the disease was of such severity that soldiers frequently lost three or more months from duty, so that the loss to the army was very great. Some cases even required evacuation to the United Kingdom. Line of communication and base hospitals and convalescent depots were heavily taxed to care for them and often as many as 50% of the available beds were occupied with this disease alone.

Sir Arthur Hurst,[1] in a review of his experience in the last war in the Middle East and of the literature, attempts to distinguish catarrhal jaundice and infective hepatic jaundice and suggests that the former is much commoner and accounts for the epidemic cases. He advances the theory first elaborated by Virchow in 1865 and developed by Rolleston, Wilcox, Eppinger and others that it is due to obstruction of the common bile duct at the ampulla of Vater, due to a mucus plug resulting from a duodenal catarrh, and that the liver is unaffected except perhaps for an ascending cholangitis of mild degree. I am sure that this is the conception which we were all taught and which is still widely held. The pathology of a disease which is rarely fatal is, of course, hard to establish. However, much light has been thrown on the problem in the last few years by means of biopsy studies and the evidence now clearly indicates that epidemic jaundice is a true hepatitis and not a duodenitis with obstruction of the common bile duct, and it is interesting to note that Hurst[2] writing just before he died, says that catarrhal jaundice, as he knew it, was now a rare disease and that most, if not all, cases of epidemic jaundice are a true hepatitis.

PATHOLOGY

In Denmark, Iverson and Roholm,[3] published a report of 160 liver aspiration biopsies without mortality. Because of the importance of the disease in wartime, Dible, McMichael and Sherlock,[4] at the British Post-Graduate Medical School, Hammersmith, undertook a study of jaundice using this method. A small cylinder of liver tissue is aspirated into a 2 mm. bore cannula passed transpleurally into the right lobe of the liver, under local anæsthesia. The specimen is fixed in absolute alcohol, sectioned and stained. I have watched this procedure carried out. It did not bother the patients and seemed to be quite safe. In fact, we were so impressed by its simplicity that we carried out a few such examinations ourselves.

However, these authors did have signs of hæmorrhage in 3 out of 126 biopsies with one death (in a patient who was almost moribund). Very properly, they emphasize this danger and after their report we desisted from further studies of this kind. Their report is full and very striking but space does not permit a description here other than along general lines. The picture is one of hepatic cell necrosis and autolysis, most marked about the hepatic vein, and leucocytic and histiocytic reaction in the portal tracts. The latter is more prominent in the mild cases and the former in severe cases. The appearance is remarkably uniform, and in many there is remarkable destruction of the liver lobule. In fact, when one studies these sections one is impressed by the widespread liver damage and one wonders how recovery can

possibly take place. However, the reticular framework of the lobules is not lost and the amazing property of liver cells to regenerate permits the rapid recovery and return to normal on this scaffold, which is usual. Serial sections throughout the course of the disease show this process clearly. Further, biopsies done on the first day of detectable jaundice show advanced hepatitis indicating that liver damage probably begins with the prodromal symptoms which are so often regarded as gastro-intestinal in origin. Intubation studies by Van Rooyen and Gordon[5] in 1942 showed that there was no evidence of duodeno-biliary catarrh. In the sections studied by Dible and McMichael there was no evidence of biliary stasis such as would occur with common bile duct obstruction. These observations are in accord with a mass of evidence by other workers that epidemic jaundice is indeed a hepatitis and the old view of Virchow and Hurst need hardly be entertained now.

The evolution of this widespread diffuse hepatitis appears to present four distinct possibilities:

1. *Complete recovery with complete restitution of the liver.*—This occurs in the great majority of cases and is shown in serial biopsies and also in post-mortem examinations on recovered cases dying from some other cause.

2. *Continuous progress of the lesion leading to death* with the pathological picture of acute or subacute liver necrosis. We demonstrated this in our fatal cases. Such cases are usually fulminating and death occurs in a very few days.

3. *Development of liver cirrhosis.*—When the disease is greatly prolonged and fibrotic changes become predominant classical cirrhosis is produced. This occurred in at least one of our cases and was suspected in several others. Several such cases were followed by serial biopsies by Dible *et al.*

4. *Residual fibrosis.*—Some cases were observed with complete clinical recovery with some residual portal scarring, and this probably undergoes complete resolution. Reversible fibrosis has been demonstrated in animals and is a similar phenomenon.

ARSENICAL JAUNDICE

The occurrence of jaundice in syphilitics undergoing treatment with arsenicals is a well known phenomenon. It has always been thought to be a toxic arsenical hepatitis. We saw many patients who were receiving arsenical treatment develop jaundice. Apart from this fact in their histories, they were indistinguishable from epidemic jaundice on clinical grounds. Aspiration biopsies showed that they were indistinguishable pathologically. However, soldiers undergoing anti-syphilitic treatment had an incidence of jaundice about ten times that of other soldiers. That the toxic action of arsenicals made them more liable to the infecting agent is a plausible and even probable explanation but it has been suggested that the infecting agent is a virus which is resistant to the usual disinfecting methods used for syringes and needles in V.D. clinics and that this might be the explanation. Non-syphilitics treated with intravenous arsenicals also had a high jaundice rate (*e.g.* Vincent's cases).

SERUM JAUNDICE

Further, there were a large number of cases of clinically indistinguishable hepatitis occurring in soldiers given yellow fever vaccine prepared with human serum, and in others given convalescent serum for the prevention of measles and mumps. Pathologically and clinically, these cases were identical with the epidemic cases and the evidence points to the presence of the infecting agent, probably a virus, being present in the human serum used and thus transmitted.

CLINICAL COURSE

Characteristically there is a prodromal period of five to ten days preceding the jaundice. The prodromal symptoms include marked anorexia, nausea and vomiting; severe retro-bulbar headache, fever, chills, muscle pain and abdominal discomfort. Any or all or none of these symptoms may occur but extreme anorexia is almost invariable. In some the prodromal symptoms are so severe that the patient is hospitalized as a fever of unknown origin, and in others the patient does not complain until he or his friends note jaundice. The anorexia may be attributed to the army diet and even dark urine often escapes the soldier's interest, if not his attention. A careful history generally elicits the information that the urine is dark and the stools light-coloured before jaundice was noticed. Jaundice develops very rapidly once it is noted and may be mild and transient or very severe and prolonged, varying from a few days to many weeks.

The physical finding vary in degree. *Jaundice* is usual but we have seen a number of undoubted

cases of hepatitis with all other signs which never became clinically jaundiced, although their icterus indices usually were above normal. *Fever* may be slight but is usually moderate and in a few cases, marked. In the average case the fever subsides within a few days of the jaundice reaching its height. Persistent fever was a most unfavourable sign. The *pulse* was relatively slow when the icterus appeared. *Pruritus* was not uncommon with the jaundice. The *liver* was generally enlarged and tender, sometimes very greatly. The *spleen* was quite commonly enlarged and tender too. *Icterus indices* were often quite high and I have seen readings well over 300. *Bile* was readily seen in the urine and the *stools* were completely clay-coloured and often costive.

Very often the severe symptoms started to subside when the jaundice appeared and a return of appetite was usually the first sign of beginning recovery.

TREATMENT

Complete bed rest was enforced until the temperature was normal, the urine free of bile and the liver no longer palpable. Diet was fat free and rich in carbohydrates and proteins were given as tolerated. Fluids were forced. Saline laxatives were frequently required. It was found that if the above criteria of recovery were not followed and the patient allowed out of bed that relapse was very likely to occur.

Convalescence. — Convalescence was usually prolonged. Fatigability was outstanding. It was policy not to force or accelerate convalescence for reasons indicated above.

Prognosis.—There was great variation. I know of cases, especially in enthusiastic field officers, who never went off duty and apparently recovered fully. These were undoubtedly very mild and the men exceptionally "tough" individuals. The jaundice stage commonly cleared in ten to fourteen days but I have known jaundice to persist for more than six months. The average case did not return to duty under ten weeks. Mortality was slight and probably less than 0.5%. However, the cases which did die were most memorable. The number which went on to immediate cirrhosis was probably small but such cases were seen by all hospitals. How many will subsequently develop cirrhosis is problematical but one cannot escape the thought that there may be a sizable number, particularly when one studies the very striking pathological sections. In this connection it is worth remembering that there is some evidence that a not inconsiderable number of cases of cirrhosis have a history of catarrhal jaundice earlier in life. I saw such a case in a young man a few months ago and there are others reported in the literature.

ALCOHOL

The question of alcohol and the possible part it plays in this disease arises. The time-honoured idea that alcohol is a direct liver poison has been questioned many times in recent years. Autopsy studies on known old alcoholics have usually failed to show liver damage. Recent dietary studies[7] suggest that cirrhosis occurring in alcoholics is due to dietary deficiencies, notably of methionine, etc., due to the chronic alcoholism in the same way that peripheral neuritis in alcoholics is primarily due to dietary deficiency. Soldiers are popularly supposed to be heavy consumers of alcohol and I suppose many are. Although I have no statistics to prove the point, I am sure that we had as high a proportion of hepatitis among teetotal soldiers as drinkers. An unkind person has suggested that the undoubted greater incidence of the disease among officers is due to the fact that officers consume more spirits than other ranks.

OFFICERS AND OTHER RANKS

The greater incidence among officers is a fact and a very puzzling one. One suggestion advanced is that officers use communal dishes in their mess and that the other ranks always use their own mess tins. In any case, it is interesting to speculate on this very curious phenomenon.

DIFFERENTIAL DIAGNOSIS

1. The *pre-icteric stage* which may last for six to ten days is often difficult to diagnose and must be essentially the problem of an undiagnosed fever. In the Central Mediterranean Forces we always had to distinguish this stage from malaria, sandfly fever and dysentery. Further, these diseases often co-existed with jaundice. The presence of a palpable, tender liver and bile in the urine were, of course, important differential points. Anorexia in soldiers is a rare complaint. When a soldier could not bear the sight of food, we were almost certain that he had hepatitis. Marked anorexia is undoubtedly the outstanding symptom and occurring as

it does in young people previously healthy, it is very striking.

2. *Jaundiced stage.*—When jaundice developed in an acute febrile form about the only disease with which it could be confused was Weil's disease or epidemic hæmorrhagic jaundice. I have seen cases of this disease and the diagnosis is rarely in serious doubt. They are always seriously ill, febrile, often delirious and, of course, are characterized by hæmorrhagic phenomena in the skin, scleræ, central nervous system, renal tract, etc. The organism, *Leptospira icterohæmorrhagica,* can occasionally be found in the blood or urine but is usually proved by guinea pig inoculation or by specific agglutination reactions. In the Central Mediterranean Forces, erroneous diagnoses of this disease were made in a number of seriously ill hepatitis cases because an artefact looking like a leptospira was found in dark field examinations of blood serum.

EPIDEMIOLOGY

I have referred above to various epidemiological features. The incubation period appears to be four to six weeks in naturally occurring cases but in those due to inoculation with human serum, the time varied from 30 to 120 days. Artificial infection of human volunteers by nasal washings from known cases has occurred in 30 to 50 days (Findlay and Martin[8]).

The route of natural entry of the infection would appear to be through the upper respiratory tract or via the food and the gastro-intestinal tract. Present observations suggest strongly that patients are most infective in the pre-icteric stage. This presents a most difficult problem in control. An interesting sidelight on this is the fact that our surgical staff had a higher incidence of the disease than our medical personnel. It was thought that this was due to the fact that surgical patients, incubating the disease but not suspected until icteric, infected their attendants, whereas most jaundice patients admitted to medicine were past their heavily infective stage.

The recent work of Himsworth and Glynn[7] and many others, which shows that dietary deficiency plays some part in the so-called trophopathic hepatitis of animals, raises the question whether troops in the field have a deficient diet. Casein is the best source of the so-called protective factors and its source in soldier's diets is milk which is in very small supply and cheese which is available in moderate amounts. The question also arises whether explosives add their measure of chemical poisoning. Such factors are only surmises at the best and if they do play a part, they only increase the soldier's likelihood of acquiring the infection.

ETIOLOGY

The mass of evidence at the present time indicates that the infecting agent is a virus. For example, the disease can be spread by small amounts of convalescent serum. Further, very small amounts of serum used in the preparation of yellow fever vaccine have their infectivity greatly enhanced during the growth of the yellow-fever virus on the chick embryo. Findlay and Martin[8] have demonstrated that nasal washings from pre-icteric and early icteric cases will transmit the disease to humans when instilled into the nose. Although the virus has not been finally identified there seems to be little doubt that it is the etiological agent. So far, the disease has not been successfully transmitted to animals.

SUMMARY

1. Infective hepatitis is an outstanding disease of this war and Canadians have been heavily affected.

2. The disease is endemic in England, Europe, North Africa and the Middle East. Epidemics of varying degree occur throughout these areas. The disease is probably endemic in Canada and a small epidemic recently occurred in Ottawa and Montreal. Perhaps we will see more of this disease in the future.

3. The outcome usually is complete resolution with recovery. However, in a small proportion of cases the process may be fulminating, with resultant necrosis and death in a small number. Residual portal fibrosis may occur with clinical recovery and it is probable that residual fibrosis may lead to cirrhosis.

4. The clinical course has been outlined.

5. Problems of diagnosis are mentioned and the clear differentiation from hæmorrhagic jaundice (Weil's disease) emphasized.

6. Evidence is reviewed that the etiological agent is a virus.

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RÉSUMÉ

Ce qu'on appelait autrefois l'ictére catarrhal doit être maintenant désigné sous le nom d'hépatite infectieuse avec lésions primitives au niveau du foie et non au niveau des voies biliaires et du duodénum. Cette maladie a été relativement fréquente durant la guerre. Bien que son taux de mortalité soit bas, l'hépatite a une évolution longue et nécessite très souvent l'hospitalisation. Elle est endémique en Angleterre, en Europe, en Afrique du Nord et au Moyen-Orient. Des épidémies surviennent assez fréquemment. La maladie est probablement endémique au Canada. Bien que la guérison soit la règle, on a observé des évolutions vers la cirrhose. Quelques rares cas sont rapidement mortels. L'étude clinique est bien connue et le diagnostic n'est pas difficile. L'influence de l'arsenic, de l'alcool et de certains sérums est discutée. La maladie de Weil est facilement éliminée. Le traitement est essentiellement hygiénodiététique. L'agent étiologique est à peu près certainement un virus; des arguments d'ordre expérimental l'ont abondamment démontré. JEAN SAUCIER

THE DIAGNOSIS OF OCCUPATIONAL ECZEMA*

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THE object of this paper is to discuss the factors upon which a diagnosis of occupational dermatitis can be made.

In the great majority of the cases, the skin reaction is of the true eczematous type; however there are numerous exceptions such as oily acne, ulcers caused by chromium derivatives, keratosis and epithelioma due to tar, soot, burns, etc.

The industrial eczema may be due to an almost interminable list of contacts. The elementary lesions are of a most ordinary type and offer no clue of an industrial or other origin and certainly do not indicate what industrial substance is their causative factor.

PREDISPOSING FACTORS

Certain causes contributing to the development of an occupational dermatitis should first be mentioned. Negroes are generally more resistant than white people. Women are more susceptible than men, and young people more than older ones. Blondes are more sensitive than brunettes.

Certain regions offer more susceptibility to reactogens. The flexor surfaces and folds are more tender than external portions of the skin. Although much exposed the palms are seldom affected. Excessive perspiration will increase the action of certain chemicals which become irritants only when moist; perspiration may also cause a certain degree of maceration of the epidermis which is an aggravating factor. Additional friction creates an ideal condition for a rash.

Cleanliness of body and clothing is of great importance. On the other hand the use of strong solutions, liquid soaps, turpentine, etc., for cleansing purposes is often the real cause of a dermatitis.

Ichthyosis, psoriasis, atopic dermatitis and seborrhœic dermatitis predispose the worker to develop a rash. The so-called "athlete's foot" must not be forgotten as it produces secondary eczematous eruptions.

A skin disease is not necessarily of an industrial origin because it occurs in a labourer in contact with irritating substances, or if occupational eruptions have been noted in the plant where he is working. Certain essential factors must be considered before a diagnosis of occupational dermatitis can be made: (*a*) the clinical diagnosis of the eruption; (*b*) the location of the lesions; (*c*) the history of the disease; (*d*) the "patch tests" (less important than the three first items).

THE CLINICAL DIAGNOSIS

First, and foremost, the correct diagnosis of the eruption is essential. It is important to determine if the rash belongs to a category known to be of an industrial origin.

We have seen cases of psoriasis, or lichen planus or pityriasis rosea mistaken for occupational diseases because the patient was in contact with explosives. We have seen cases of early syphilis in which the patients were given compensation because their rash was considered industrial.

We do not intend here to discuss all the various occupational skin hazards, as 90% of them are of the eczematous type, whatever the causative agent. We will limit ourselves to a brief description of eczema.

1. Let us recall that it can be one of two types: the *acute* and the *sub-acute* or *chronic*.

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The *acute type* is characterized at the onset by œdema and redness; this first period is shortly followed by the formation of small vesicles, which are soon ruptured; then follows a period of oozing, where we see the formation of innumerable new vesicles which in turn burst and ooze. This may last days and even weeks if contact with the causative agent or some other subsequent irritants is not avoided. After a certain time we will note in the eczematous areas patches which are erosive and "weeping", others offering vesiculation and crusts. This condition is accompanied by pruritus and scratch lesions.

If the irritating factor is removed and proper treatment is given, these symptoms will rapidly disappear. The congestion subsides, the formation of new vesicles stops, the oozing decreases, a new epidermis appears, the erythema becomes fainter and finally cure is achieved, leaving no apparent sequelæ.

The *sub-acute* or *chronic type* is not so severe. It can be seen in those who have gone through the acute stage and have not received adequate treatment. Adequate treatment will tend to eliminate all irritating causes, the industrial causative agent as well as other irritants such as cosmetics, soaps, dusts, fumes and strong topical remedies. The sub-acute or chronic type can also be seen in those patients whose integument is less sensitive or less exposed to irritants.

We observe a certain thickening of the skin: this lichenification is accompanied with a dull redness. Crevices, crusts, and scratch lesions are often observed. The areas involved are usually more restricted and interspaced with normal ones. There is a mild pruritus. The housewife dermatitis is a good example of this variety of eczema.

2. An accurate diagnosis must also be made where a contact dermatitis is superimposed on a pre-existing one, such as psoriasis or neurodermatitis disseminata. In these instances if the worker is properly treated we will see the industrial eczema disappear and observe the persistence or recurrence of signs due to psoriasis or neurodermatitis. The co-existence of a seborrhœic dermatitis with a contact eczema should also be carefully considered.

3. A dermatitis medicamentosa very often complicates the diagnosis of an eruption. At the onset, a worker may show on the exposed parts only a faint erythema accompanied by a slight pruritus. Even if he carries on with his work, this reaction may disappear rapidly by a spontaneous "hardening process", if no irritating topical remedies are applied.

On the other hand, it may become aggravated. In that event cure will be brought about in three to six weeks by the elimination of the offending agent and the application of emollients.

Unfortunately it happens frequently that an irritating ointment is applied (containing sulphur, mercury, or worse, the sulfa drugs) which will give a severe type of eczema, with a tendency to spread and to generalize. This individual is polysensitized. He reacts violently to many chemicals whether they are industrial or therapeutic. The initial industrial rash has become a dermatitis medicamentosa.

In our experience overtreatment in patients where there exists sensitization to various chemicals is the main, if not the sole cause, of the long duration and of the generalization of an occupational skin disease. Here the initial industrial contact is no longer responsible for these troubles, which persist months after the patient has been laid off work. Inadequate therapeutic management is the causative factor.

Another frequent manifestation of dermatitis medicamentosa occurs when drops are used for earache or conjunctivitis. There follows a skin reaction which spreads to the adjoining regions, involving the whole face and neck. The eruption is falsely considered as occupational because the patient is exposed to chemical contacts while at work.

Soaps and cosmetics deserve a special mention. Many women suffering with an industrial rash, even if properly treated by rest and soothing remedies will offer, after several months of unemployment, erythematous and scaly lesions on the dorsal aspects of fingers and hands, which are naturally attributed to their former work. As a matter of fact they are only suffering from the usual "housewife dermatitis". While at home, they do housework, using soap, cleaning solutions, rubber gloves, etc. These various contacts are accountable for the continuance of the eczema. Hospitalization cures them rapidly.

Cosmetics, such as hair dyes, nail polish, lipsticks, perfumes, toilet water, as well as jewels, wrist watches, earrings, and furs may cause, among sensitized individuals, an eczematous condition of the forehead, eyelids, lips, ear-lobes, neck, forearms. It may spread spontaneously or through the agency of an irritating remedy.

On account of all of these factors, compensation is often paid for a long period to a female worker without an industrial rash or after it has been cured.

Finally, the industrial physician must keep in mind that there are self-inflicted skin lesions. These are usually of an ulcerative nature, but may sometimes simulate eczema.

THE LOCATION OF THE LESIONS

After the eruption has been clinically classified as one which may possibly be due to industrial causes, the physician has to consider whether or not it is located in exposed areas. The occupational dermatitis will primarily appear on these parts, which most usually are the hands, forearms, face and neck. It might remain confined to these regions or show a tendency to become extensive if the individual is highly sensitized.

Here, we must emphasize once more that usually the spreading from exposed to covered and remote parts is due to a superimposed dermatitis medicamentosa. However, this condition can also happen in those instances where there are liquid or oily chemicals impregnating the clothing.

Certain locations will immediately awake the idea of a non-industrial origin (topical remedies, cosmetics, soap). As was said before, eczema of the eyelids, forehead, earlobes, neck, irregular patches on the dorsum of fingers suggest the possibility of a reaction due to ointments or "drops", nail polish, hair dye, fur dye, hat band, soap, rubber gloves, etc.

Dermatophytosis of the toes is often responsible for eczema of the feet. When the latter is located on the dorsal aspect of the feet, it may be due to the dye of socks or shoes.

To summarize: Let us say that the initial site of an industrial eruption is located on those parts exposed to irritating contacts. Conversely, the lesions may be generally considered as being of another nature when their initial, or their present location or their maximum of intensity is not situated on regions ordinarily exposed to occupational contacts.

THE HISTORY OF THE DERMATITIS

Many conditions have to be carefully analyzed in order to establish the exact origin of the eruption. First of all the physician must know if other employees have shown similar skin diseases, if there are irritants in the plant, if the patient actually comes in contact with these. For instance, a carpenter handling only the usual woods, cannot reasonably attribute his eczema to working conditions. A man doing clerical work exclusively in a detached pavilion of an explosive plant, who shows a rash, cannot possibly impute it to these chemicals, because he was never exposed to them.

It would also be interesting to know if the claimant had any similar eruption previously. Fortunately for the investigator this is not the important item. For many reasons the information may not be accurate: the claimant may be honest or dishonest, may ignore the true nature of his former skin ailments, etc. For instance, a patient who has had a skin eruption in the past does not make a claim because he thinks it is a recurrence of the previous trouble; nevertheless, he is now suffering from occupational eczema. Conversely, a woman who has had housewife dermatitis for years may now fraudulently claim compensation.

The main points to be considered are that the dermatitis occurs when the patient is at work, in contact with irritating substances, improves or cures when he is away from them and properly treated, shows relapses upon his return to the same contacts. These are the conditions required to establish a connection between the work and the dermatitis, providing the nature and the location of the lesions fit in with the history of the case.

Here can be stated the rules laid down by industrial dermatologists:

Rule 1.—Occupational dermatitis usually appears while the person is at work or shortly thereafter disappears or improves when he is away from work, and reappears soon after his return.

Rule 2.—If a supposed case of occupational dermatitis does not recover or markedly improve after two months' absence from work, look elsewhere for the cause (Schwartz).

PATCH TESTS

Some think that this investigative procedure alone gives the key to the diagnosis. This is certainly untrue for various reasons. They are undoubtedly valuable but usually they only contribute an added factor in the accumulation of evidence.

May we here say that we are only trying to formulate and discuss a few general principles which will assist in determining whether a

worker is entitled to compensation or not. The only important fact is to determine whether the rash is due to the patients' work taken as a whole.

It is left to researchers in the field of allergy and dermatology to point out which is the exact contact; which is the specific chemical compound or even which part of it is the true offending agent. These findings will help to prevent recurrences in the same individuals or similar eruptions amongst fellow-workers. To illustrate this idea let us quote a paper by A. F. Hall (*J. Am. M. Ass.*, **125**: 179, 1944). This author doing research work in an aviation plant found out first that in 580 cases of alleged "dural" dermatitis 36% were not even of an occupational origin. This elimination was mostly done by the clinical diagnosis and the location of the lesions. In the 64% left, by skin tests 5% only were really demonstrated as due to dural. In the remaining 59% it was due to various other professional causes, some of which were unidentified.

However the practical fact remained that the skin ailments were due to work in 64% and compensation was paid. This is the only point we are considering here.

If negative: one cannot infer that the dermatitis under observation is not of an occupational origin. The patch tests may have been performed with other substances than with the truly offending one. After all, a worker comes actually in contact with several irritants. The test may have been done in a skin area not sensitized, or which may have become desensitized. Even when made with the responsible irritants, the patch test may not be done under exactly the same conditions as met with during work, to wit: friction, heat, perspiration, maceration. The test may be done with a dilution which is too weak.

If positive, it does not necessarily imply that the chemical used is the causative factor. The individual may give a positive reaction to this substance only because he has been previously sensitized to it.

One has also to consider that a patient may give a positive reaction to a certain substance because it has been used in a concentrated dilution, much stronger than that met with in working conditions. In reality this reaction is a false one: it is the usual phenomenon caused by a primary irritant.

To summarize: the patch is "only a link in the chain of evidence from which a diagnosis of industrial dermatitis can be made. The results must be correlated with the workers' particular occupation, the history of the dermatitis and the site and morphology of the lesion in order to arrive at a correct etiology" (Schwartz and Tulipan).

CONCLUSION

To establish the nature of an industrial dermatitis, we do not have proofs of an absolute value.

The conclusive factors are based on the nature, site and evolution of the lesions.

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RÉSUMÉ

Le diagnostic de l'eczéma industriel est très difficile. Pour arriver à le poser avec exactitude, il faut en faire la preuve clinique, étudier la localisation de l'éruption, vérifier les circonstances de son apparition et faire l'épreuve des "patch tests".

La preuve clinique placera l'éruption dans son cadre nosographique exact et éliminera les étiologies erronées et les dermatoses préexistantes. L'éruption devra être localisée à un endroit véritablement exposé aux irritations d'ordre industriel, toutes causes d'erreur et coincidences ayant été éliminées. L'origine précise de la dermatose sera recherchée soigneusement; on fera, au besoin, l'épreuve du congé d'observation qui doit toujours faire cesser l'eczéma industriel. La persistance d'un eczéma après deux mois d'absence de l'usine ou de l'atelier élimine l'étiologie industrielle. Les "patch tests" ont une importance très accessoire; leur positivité n'est qu'un anneau de la chaine des autres évidences.

On devra, en définitive, étudier tout particulièrement la nature, la localisation et l'évolution des lésions.

JEAN SAUCIER

THE SCOPE OF ANÆSTHESIOLOGY

By Capt. Shirley Fleming, R.C.A.M.C.

THERE has been much discussion in recent years, both in print and at professional meetings, regarding the future of anæsthesia. It is recognized as a specialty now, and, as such, should have its scope at least roughly indicated for the benefit of those wishing to be anæsthetists and those with whom they work. The various health schemes, government and independent, have given particular impetus to the discussion of the position of the anæsthetist in a medical community, it having changed much in the past two decades because of the development of new anæsthetic agents and the need for a specialist to administer them. The term anæsthesiology indicates this progress by denoting the recognition of a science as well as an art of anæsthesia.

In many places an anæsthetist has been anyone who would put a patient to sleep for purposes of surgical operation. He might be either a trained medical practitioner, a nurse, an orderly or a technician. Such an anæsthetist has not been called upon to accept any responsibility for the patient, who remained only the surgeon's case throughout his illness, the surgeon very often directing the course of the anæsthetic. In these statements outposts are not referred to, but communities with an apparently adequate medical service, often including a well equipped hospital. At the other extreme are the institutions in which there are organized anæsthetic services with a trained staff which embrace a number of duties such as will be mentioned subsequently.

It is this latter type of service which is carried on in most military establishments in the allied armies, with certain variations for self-evident reasons—the quality of the personnel and the equipment provided, for instance. The fact that this is so is promising for the future, because it is difficult for professional people and laymen to accept less than they have been led to expect, and those who have experienced a true anæsthetic service will not be content with any mediocre substitute. The places so far unaware of these advances will be forced to appreciate them when service personnel return. Interest has been stimulated in anæsthesia as a rapidly growing specialty, and much training has been given under army schemes because the need for trained anæsthetists to help provide satisfactory treatment was recognized.

The time when a doctor could be called an anæsthetist simply because he could use some agent to put a patient to sleep has gone, because now there are many agents and techniques, and he is expected to be able to use the most suitable of the many available. It is realized that many complications both during and after operation may be forestalled if the most suitable anæsthetic is properly administered to a carefully prepared patient by the most appropriate technique.

There are two aspects to consider in regarding the scope of anæsthesiology. Both are important, the one having to do with personnel and equipment involved in the practice of anæsthesia, and the other with the work done in co-operation with other branches of the profession. Together they are the background for any treatment given.

The simplest arrangement is where the anæsthetist works by himself in his specialty and services his own equipment. This is modified until there is a service with numerous physicians, nurses and orderlies attached to it. The chief anæsthetist is then responsible for directing his juniors, detailing duties to nurses and orderlies and instructing them in the care of the patients and equipment and as assistants to the anæsthetists. He also supervises the keeping of records, keeps abreast of recent work in his field, usually being able, with the personnel and number of patients under his care, to do a certain amount of clinical research in his department.

The relationships with other physicians are many, whether the anæsthetist is alone or has a staff, whether he works in a large or small community, whether he is attached to a hospital or works by appointment with other doctors, because his patients are always referred. Predominant, and first to mind, is his obvious use to the surgeon about to operate. In many places the anæsthetist has been given the responsibility of preparing the patient for operation, and stating when he is in a suitable condition for surgery. This has been found advantageous particularly with patients for whom fluid and sedative therapy are necessary preoperatively. By accepting this part of the treatment of a patient the anæsthetist is better acquainted with his progress and the anæsthetic becomes an incident — although an important one — in the scheme of treatment, with more satisfactory results than if the anæsthetist is present just for the operation. Sedation is within the field of the anæsthetist, and it has been found of great value to have fluid administration under his control as well; very often his knowledge of this subject becomes very wide, and he may make himself an authority amongst his colleagues because of the wealth of his experience in it.

An important part of preoperative treatment is the visit to the patient to determine his physical and mental state as a basis for the sedative order, and to gain his confidence. These preoperative measures should be within the province of the anæsthetist and not covered by the surgeon. There are still some surgeons who feel that this is presumptuous on the part of the anæsthetist, but, certainly, to do his best work,

it must be a part of it. Then the agent and the technique most suited to the patient for the surgery proposed must be determined. Ideally the decision is made by the surgeon and the anæsthetist together, the former stating as nearly as possible what he intends to do surgically and the latter suggesting the anæsthetic which will provide the best operating conditions for the probable procedure for the particular patient. The surgeon may contribute his information by a careful booking thus delegating the final decision to the anæsthetist, which has been found to be a satisfactory arrangement.

The care of the patient during anæsthesia and operation is the responsibility of the anæsthetist. Occasionally a surgeon likes to continue full command of the treatment throughout operation, but there are few who do not recognize the benefits of having the patient under the care of the anæsthetist who, when necessary, advises of changes in his condition and treats them. It is during the administration that the anæsthetist must exercise his skill, even should he delegate any other duties to others. He produces analgesia and suitable operating conditions to the best of his ability, exercising the necessary precautions against complications and treating such as arise. If he so desires, this may be the only service that anæsthesia, through him, serves, and in many cases this has been all, or even more than all than was expected. It is probable that that day has passed or will have shortly, and anyone calling himself a specialist in anæsthesiology will have to broaden his activities.

The postoperative care of the patient has been assumed by the anæsthetist as successfully as the preoperative, in regard to the prevention and treatment of complications. He is usually more aware of impending respiratory and cardiovascular changes than the surgeon, who is more interested in the surgical condition treated, and is willing to leave the necessary preventive and medical treatment to the anæsthetist. It would appear, quite frequently, that patients could be sedated postoperatively more satisfactorily by the anæsthetist than by the surgeon, who usually simply leaves a p.r.n. order for morphine, when sometimes other drugs would be more effective or less conducive to complications, but are not familiar to the surgeon. However, let it be understood that both pre- and postoperatively the anæsthetist has worked with the surgeon and not to the exclusion of the latter from the treatment of his patient. It has been done because this team-work has proved satisfactory to both.

The anæsthetist has been called upon often to act as the liaison officer between the surgeon and the operating room staff. He helps draw up the operating schedules, and, sometimes, is responsible for the professional opinion towards the addition of new equipment and techniques.

There are many ways in which the anæsthetist may aid in the treatment of a surgical patient, and these are recognized, on the whole, as a part of the practice of anæsthesia; but, the term anæsthesiology suggests as well the treatment of patients other than surgical, the limits of which have not been established yet. In the surgical field the scope has become broader in that there are more anæsthetic agents and more techniques of administration being developed continually, but in the medical field anæsthesiology is being appreciated more and more as a specialty to embrace numerous branches as yet not included in any other, successfully. The anæsthetist would be wise to make them his rather than let them drift into the hands of his colleagues, for they should be fruitful. A few remarks will indicate the potentialities in connection with the treatment of medical patients.

The anæsthetist may be of service in the field of medical diagnosis when, often, the anæsthetic procedure acts as a treatment also. An anæsthetic may be given for the movement of a joint to determine its objective state; this helps in the diagnosis of the pathological condition. A period of very light anæsthesia is frequently of service to a psychiatrist in the examination, diagnosis and treatment of patients. Injection of a local anæsthetic into a tender area may serve as a factor in diagnosis, treatment in itself in that it relieves pain, and, because of the relief of pain, permits giving other treatments. Barbiturates have been used successfully in the investigation of certain cases of hypertension.

The diagnosis of peripheral vascular disease is aided by lumbar sympathetic nerve blocks, the vaso-spasm being relieved and the state of the circulation due to pathological changes alone being demonstrable then, making the assessment of the state of the veins possible. It serves as a treatment, too, in these cases, by relieving the pain to a greater or lesser degree, depending on the extent of the vaso-spasm, and indicates the probable efficacy of surgery.

The pain accompanying severe coronary disease and the discomfort of severe asthma may be relieved by blocking the thoracic sympathetic nerves by paravertebral block. The procedure may be used to indicate the possible results should surgical treatment be contemplated, but has been found to give excellent and lasting relief to patients for whom surgery was out of the question.

Many other severe pains may be treated by appropriate nerve blocks, pains such as those caused by malignant disease and its secondaries for which surgery can do little or nothing. Few physicians consider nerve blocks for such purposes because such treatment does not occur to them, but if an anæsthetist searches for a few such cases and suggests treatment for the patient of whom he hears, and offers to perform the blocks, he will find his services in demand and the nerve blocking field his. The physicians are grateful because there is seldom any other treatment alternatively, and they are able to do little to relieve the increasing pain and discomfort except prescribe opiates, and the patients are pleased because their lives under drugs are unpleasant and pain is ever with them. These patients are more appreciative of the services of the anæsthetist than the surgical ones because they have been relieved of a pain of which they have been too much aware, while the average surgical patient is prevented from feeling the pain of the operation of which he knows nothing.

In the obstetrical field the anæsthetist has established his usefulness during the surgical procedures but it would seem as though there is more scope preoperatively here than has been granted. Anæsthesia for dental surgery has been included in the practice of many anæsthetists, the demand varying greatly in different communities.

The anæsthetist may find resuscitation his responsibility. Inhalation therapy is delegated to him, usually, because very often while under his care a patient requires such treatment and it is considered that he knows more about it than others. It is then only a step to include gas casualties because they require this type of treatment primarily. The anæsthetist is probably nearer to being a clinical physiologist than other physicians, at least he has the opportunity to be such.

In some army medical units which have workshops for making and repairing medical apparatus and instruments the anæsthetist is in charge of them. Most anæsthetists have an interest in experimental work, either in regard to making improvements in apparatus or in making contact with experimental workers in other fields, both laboratory and clinical, an important part of anæsthesiology. Advances in anæsthesia are dependent on advances in physiology, pharmacology, biochemistry and pathology. Observations by anæsthetists give information to those who investigate in other sciences. The relief of pain for medical patients offers a wide field for practice and research which, with interest on the part of anæsthetists, should allow for as rapid strides in clinical advances as there have been in the realm of surgical anæsthesia.

As it stands, there are few limits to the scope of anæsthesiology other than those imposed by the patients available, the interest and co-operation vouchsafed by professional colleagues, and the enthusiasm and diligence of the anæsthetists themselves. It is now, while there is a more lively interest in the development of the specialty than heretofore, that the position anæsthesia is to have must be indicated by the efforts of all those interested in its future.

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Case Reports

SELF-INFLICTED WOUND OF BRAIN WITH FOUR-INCH SPIKE*

By Arnold Branch, M.D.

Saint John, N.B.

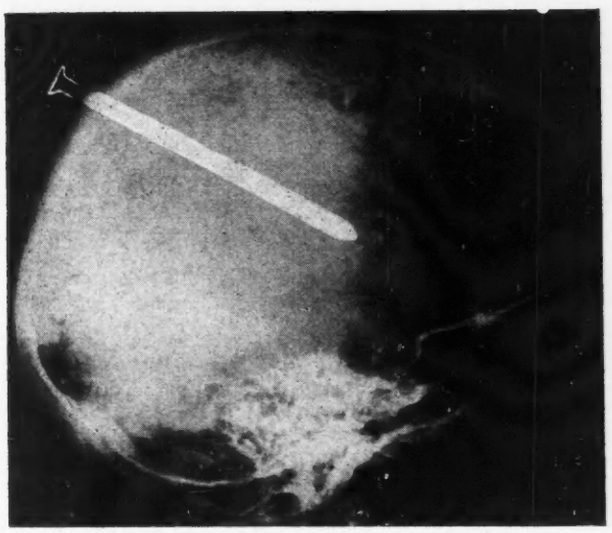
The accompanying x-ray of the head of a living woman showing the situation of a four-inch spike seems worthy of publication with an explanatory note as it illustrates several points of interest. The first is that such a wound could be self-inflicted, and the second that there was no unconsciousness or demonstrable neurological signs for hours after, the woman being able to walk without assistance.

CASE REPORT

A woman of 70 in a depressed state of mind woke her brother at 5 a.m. on the morning of March 28,

* From the Bureau of Laboratories, Province of New Brunswick, Saint John, N.B.

1944, and told him that she had driven a four-inch spike into her head. He telephoned a physician and after waiting some time took her to Saint John to see Dr. J. W. Baxter, who sent her to the General Hospital for an x-ray film. She was admitted there at 2.15 p.m. when the x-ray of the skull was taken by Dr. A. S. Kirkland (Fig. 1). The surgeon on duty, Dr. J. R. Nugent, removed the nail in the operating room without any anæsthetic at 5 p.m. and she was given prophylactic inoculation of antitetanic and antigas gangrene serum. The surgeon noted that she was fully conscious and coherent and assisted in moving herself on to the operating table. No sensory or motor disturbance was noted and during removal she complained of no pain and no reflexes were stimulated. The pulse rate was 96, respirations 24, and temperature 98.4° F. She was loquacious but not unruly. She was given sulfathiazole gr. xxx, nembutal gr. 1ss and transferred to the Provincial Hospital before midnight.



Additional history taken at the Provincial Hospital stated that she was single and had been treated for syphilis twenty years before. Examination showed she was poorly nourished but well kept. She was quiet, co-operative, lucid, not upset or concerned and said she had attempted suicide because of poverty. On physical examination the pulse was 100, blood pressure 130/60, the pupils did not react to light or accommodation and the right was dilated. Other reflexes were normal. On March 29, the temperature was elevated to 102° F., the red blood count was 3.7 million and the white cells 7,700. The Kahn test was 4 plus and the Kolmer Wassermann negative. A lateral x-ray film of the head showed the presence of air in the ventricles. On the following day, March 30, the temperature remained elevated to 103° F., the urine showed some albumin and hyaline casts. There were symptoms suggesting encephalitis, she became semiconscious, the temperature rose to 104° F. and she died on the morning of March 31.

AUTOPSY

This was performed 10 hours later after embalming. With the exception of a beginning decubitus ulcer on the right thigh and an old abdominal operative incision in the mid line of the lower abdomen there was nothing of note outside the head.

There was reddening and œdema in a shaved area posterior to the vertex. In this area there were 9 scabbed small circular puncture marks counted. The most posterior one was larger and represented the site where the 4-inch spike was withdrawn by the surgeon. This was situated slightly to the left of the mid line and about midway between the vertex and the lambda. The only other contusion on the scalp was a linear scar also scabbed ½ inch in length slightly oblique in the region of the right pterion, *i.e.*, near the junction of the temporal, frontal and parietal bones in front of the right ear. The edges were opposed and the laceration had not pierced the lower layer of the scalp.

The incision for reflecting the scalp was made from ear to ear below the main puncture marks described above. There was a diffuse hæmatoma corresponding to the site of the nine puncture marks and also a separate hæmatoma in the laceration in the right temporal region. The right temporal muscle also contained blood which appeared to have no connection with the hæmatoma above but no bruisings were found on the scalp directly above this.

The skull showed an area of hæmorrhage around a circular clean cut perforation corresponding to the largest hole seen in the scalp (see above), and this could now be located as slightly left of the sagittal suture. A 4-inch spike corresponding to that removed previously at operation by the surgeon, Dr. J. R. Nugent, was inserted into this perforation which it exactly fitted and it was seen that the nail protruded at an angle of about thirty degrees posteriorly to an estimated vertical line with the patient standing. There was also a slight angulation to the right from the sagittal plane estimated at about seven degrees. A measurement of the thickness of the skull through the perforation was taken by marking on a swab stick with a pencil on the surface of the outer and inner tables of the skull and found to be ⅝ inch. The skull was not adherent to the dura and there was a small area of hæmorrhage around a perforation in the dura continuous with that seen externally. The dura was otherwise pale due to the embalming.

The dura was next reflected and was only slightly adherent under the perforation to the underlying brain, where there was also a small area of hæmorrhage. On scraping this away a perforation was localized on the left just anterior to the central sulcus (Rolando) and through the uppermost part of the motor gyrus. There was no purulent exudate on the surface of the cerebrum or the base of the brain. The brain was removed and the two hemispheres separated. The corpus callosum was severed in the sagittal plane to the left of the septum pellucidum. There was a tubular blood clot protruding from an opening in the vault of the left lateral ventricle and this is shown to be the track taken by the spike, since insertion of this in the point of entrance in the cerebrum resulted in its protruding into the left lateral ventricle and displacing the blood clot. There was no free blood in this left lateral ventricle nor exudate, but this was distended and larger than the opposite side when this was exposed.

COMMENT

Although there was no reason to suspect that this was other than suicide, we were sceptical that such a wound could be self-inflicted. The skull cap was thus replaced, held tightly on and one manipulator using the same hammer as used by the patient and a similar nail failed to perforate the skull, but bent the nail. Another trial, by another operator, was successful. Later we tried it on an elderly male at autopsy, before the brain was removed and had no difficulty in penetrating the brain. For further opinion we sent the history and the x-ray photograph to Dr. Wilder Penfield, who presented it at a meeting of the Montreal Neurological Society. A lady volunteer member sitting before a mirror

convinced them that it could be self-inflicted although, as Dr. Penfield wrote, the experiment was naturally not completed!

CHRONIC DISSEMINATED TUBERCULOSIS*

By Adrian Anglin, M.D. and Lieut. Eric Rogers, R.C.A.M.C.

London, Ont.

A consideration of the factors involved in chronic disseminated tuberculosis concerns the relationship between the pulmonary and extra-pulmonary lesions. A complete evaluation of this complex subject has not been attempted in this brief report. In 1810 Laennec[1] drew initial attention to the condition in stating that older soft caseous foci could lead to extensive dissemination in other organs. Extra-pulmonary tuberculosis is a restricted term. Thus, lesions caused by local extension of the pulmonary process (*i.e.*, involvement of pleural or pericardium) or spread of the infection via anatomical routes (*i.e.*, gastro-intestinal tract) cannot be strictly regarded as extra-pulmonary.

The following case presents interesting manifestations of the hæmatogenous spread of tubercle bacilli, with apparent eventual recovery.

CASE REPORT

A thirty-five year old housewife attended the Out-Patient Clinic at St. Michael's Hospital in December, 1935, complaining of continuous pain in the left ankle when walking. She gave a history of "spraining" her left ankle eight months previously. X-rays of the joint were negative. On January 6, 1936, the patient was admitted to hospital complaining of a persistent productive cough of three weeks' duration. There is no record of chest plates at this time. The left ankle was swollen, with marked tenderness below the external malleolus. The joint capsule was thickened. X-rays showed irregular bone destruction at the lower end of tibia. A diagnosis of tuberculous arthritis was made. The joint was immobilized in a plaster cast with the foot at right angles. When the cast was removed one month later, a sinus had developed on the lateral aspect of the joint. The sinus was treated with local applications.

In October, 1936, the patient was re-admitted, continuing to complain of left ankle pain and also sharp left chest pain. Chest plates revealed moderately advanced bilateral tuberculosis. Tubercle bacilli were recovered from the draining ankle sinus. The patient was admitted to the Hamilton Mountain Sanatorium in December, 1936. During 1937 symptoms pointing to tuberculous enteritis and genito-urinary tract involvement became manifest. Since investigation was inconclusive and symptoms eventually cleared, a diagnosis was not made.

In September, 1938, she developed back pain. X-ray films showed an early vertebral abscess at the level of the eleventh dorsal and a thinning of the intervertebral spaces of the ninth, tenth and eleventh dorsals. In spite of treatment on a Bradford frame between October, 1938 and July, 1939, the disease showed extension. An Albee bone graft was done in August, 1939.

The patient had been having irregular periods with clots, an irregular degree of pain with menses and slight vaginal discharge. In April, 1939, a subtotal hysterectomy, bilateral salpingo-oöphorectomy and appendectomy was performed. The specimens showed tuberculous endometritis, tuberculous tubo-ovarian abscess and tuberculosis of the ovary.

On admission to the Hamilton Sanatorium in December, 1936, the pulmonary disease was widespread. It was the hæmatogenous type without sputum. This cleared during the first year. However, in October, 1938, there was evidence of spread. This continued and sputum was positive on concentration examination in October, 1939. A right pneumothorax was unsuccessful. A right phrenic crush was done. A three-stage thoracoplasty was done during September, October and November, 1940. The sputum remained positive and x-ray showed persisting cavities. A repeat thoracoplasty was done in June, 1942. The sputum diminished markedly, but was occasionally positive (Gaffky 1).

The unhealed left ankle continued to cause distress. For this reason, amputation was carried out below the knee in December, 1942. The stump healed uneventfully. The patient was discharged from sanatorium in November, 1943.

In May, 1944, she reported to the Out-Patient Department at St. Michael's Hospital weighing one hundred and ten pounds. She had no cough or sputum. X-ray revealed no evidence of active tuberculosis. In October, 1944, the patient weighed one hundred and twenty-seven pounds and was feeling well. Examination of the chest revealed a few basal râles and x-ray showed no extension of the tuberculous process. In February, 1945, she continued to feel well and was able to carry on with her daily household duties.

PATHOGENESIS

Since Laennec[1] first discussed the problem, many varied and controversial theories on the source of widespread tuberculous dissemination have been advanced. It is generally agreed that the four main probabilities are: (1) The primary complex, which may remain actively virulent, gives rise to repeated circulatory invasions of bacilli, usually via the pulmonary lymphatics. (2) Repeated re-infection, from endogenous lymph glands. (3) A post-primary pulmonary focus, or an extra-pulmonary focus discharging showers of bacilli into the circulation. (4) A chronic tuberculobacillæmia of unknown origin.

In reviewing 297 cases of active generalized miliary tuberculosis, Auerbach[2] supports the first possibility. Laennec[1] and Buhl[3] agree with the third theory. Reisner[4] points out that "the pronounced morphological and topographical similarities between the chronic disseminations and the acute forms of miliary tuberculosis, and particularly the frequent association of the former (chronic) with extra-pulmonary lesions,

* With a report of a case from St. Michael's Hospital, Toronto.

are points in favour of their hæmatogenous origin."

PROGNOSIS

The meninges, genito-urinary tract, bones and joints and peritoneum are the sites where the extra-pulmonary lesions are most frequently found. In Reisner's[4] 240 case series, solitary skeletal foci occurred in 46.2% of cases, while multiple skeletal foci occurred in 20.5%. He states that extensive and progressive pulmonary tuberculosis cannot be considered as a frequent cause of death in cases with extra-pulmonary lesions. Acute miliary tuberculosis and meningitis were the strikingly frequent causes of death in 20.9% of Reisner's 91 cases, with chronic extra-pulmonary lesions at the time of death.

Kayne *et al.*[5] found that 40% of their 83 cases coming to necropsy terminated with meningitis. Multiple metastases, toxæmia and general cachexia appeared to be the fatal factors in 41.7%. Active progressive pulmonary lesions were considered causative factors in only 12.1%.

Since his series had not been subjected to prolonged follow-up, Reisner did not reach conclusions concerning life expectancy in cases of chronic disseminated tuberculosis. The case presented demonstrates that the possibility of recovery to almost normal health and activities definitely exists.

DISCUSSION

On reviewing the available literature on this subject, one is struck by the scarcity of data available in English language journals. European investigators have borne the brunt of the investigation to date.

The case presented here required extensive surgical treatment to control her lesions. This appears to have been an important factor in her apparent recovery. The value of well-timed surgical interference with each complication, as it arose, is well demonstrated. Following amputation of the left leg, the patient's progress has been uneventful. It is very possible that the left ankle was the focus of dissemination of the extra-pulmonary lesions.

SUMMARY

A case of chronic disseminated tuberculosis with apparent recovery is presented.

The subject of chronic disseminated tuberculosis is briefly reviewed.

The authors wish to acknowledge with thanks the co-operation of the staff of the Mountain Sanatorium, Hamilton, for information supplied concerning the case presented.

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CÆSAREAN SECTION

(Report of a case)

By W. Bergmann, M.D.

Meadow Lake, Sask.

Mrs. C., a multipara with 11 previous normal labours, was admitted on June 12, 1945. She was flowing moderately, and had had several moderate to severe hæmorrhages, the last one on the night previous to admission.

Examination showed a moderately well fed woman, somewhat yellowish of colour looking quite anæmic. Patient felt somewhat tired but otherwise well. She had rested in bed the last three weeks, as soon as the hæmorrhages began. Examination showed her to be about 7½ months' pregnant; the uterus was ovoid, normal shape, the child moved and the fetal heart sounds were good. Sahli was 55%. Blood pressure 110/70, pulse 86, regular, equal. Physical examination showed no abnormalities. Vaginal examination showed the cervix to be uneffaced, long, and placental tissue covering the ostium internum could clearly be felt. There was some hæmorrhage following the examination. Patient was typed and cross-typed, and she received Trinite 2,000 c.c. Blood was collected and 900 c.c. held in readiness, a small 450 c.c. plasma transfusion was given. The next morning preoperative she received 450 c.c. blood.

Operation was done under spinal anæsthesia of 70 mgm. novocaine and infiltration of 80 c.c. novocaine 1% with adrenalin. Patient received one-half hour before operation luminal gr. 1½ and seconal gr. 1½. Operation was performed in the classical manner.

The only modification I wish to mention here is that I thought it a good idea to encircle the area of my proposed intra-uterine incision with catgut No. 2 sutures to control bleeding. As I

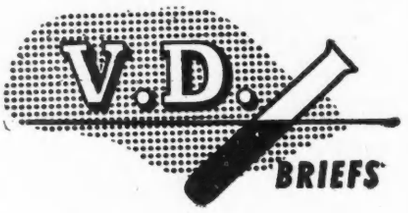
work alone and have only one nurse to help me, I cannot compress the uterine vessels during the operation to minimize blood loss. I think that this method of encircling did help considerably to minimize bleeding. The steps of the operation were otherwise done as routine: Skin-fat-fascia; ordinary paramedian incision; the rectus retracted; stay sutures through the uterus to hold the uterus firm against the peritoneum to avoid spilling of fluid; hæmostatic sutures inside the uterus; oxygen administered; incision slowly in the uterus musculature in middle line; injection of pituitrine ½ c.c.; incision into the fetal membranes; removal of fluid by suction (there is no rush as the cut musculature does not bleed to any extent); and extraction of the child. Suture of the uterus after removal of the placenta in four layers of chromic No. 2 catgut. There still is very little bleeding, as more pituitrine is given after placental removal and uterus is well contracted. The last suture approximates the uterine serosa as well as possible. There is still not much bleeding. The hæmostatic sutures are now removed. There is now a little bleeding from the stitch openings, controlled by pressure. Routine closure of the abdomen.

The woman made a good recovery and was discharged after 9 days. The child was born alive, but the weight was only 4 lb. and it died three days later.

I wish to point out that for the surgeon in an isolated area who has to perform a Cæsarean section with very limited assistance, it seems that the method described of inserting sutures around the operative field tends to minimize hæmorrhage, and permits a more unemotional approach to this operation. It seems that there is not so much need of rushed and maybe not altogether careful work, and the final approximation of the cut uterine musculature can be done more neatly, and possibly the resulting scar should be better than with through and through sutures.

Largest and most prized member of the herring family is the shad, generally regarded as one of the best fishes of the Atlantic Coast. It is now a Pacific Coast fish since its transplanting there in the 1870's.

Venereal Disease Campaign



Cases of Venereal Disease Infection Reported by Provincial Health Departments to the Dominion Bureau of Statistics, 1944

	Gonorrhœa	*Syphilis*	*Ratio gonorrhœa-syphilis*
Prince Edward Island	20	35	0.6
Nova Scotia	1,663	496	3.3
New Brunswick	913	573	1.6
Quebec	3,936	6,539	0.6
Ontario	7,317	5,225	1.4
Manitoba	1,737	663	2.6
Saskatchewan	1,123	360	3.1
Alberta	1,348	750	1.8
British Columbia	2,976	1,270	2.3
Canada	21,033	15,911	1.3

In 1944, 21,033 cases of gonorrhœa and 15,911 cases of syphilis were reported by provincial health departments to the Dominion Bureau of Statistics. The ratio of gonorrhœa to total syphilis was, therefore, 1.3 to 1.

The experience of the three Armed Forces in Canada from 1940 to 1944 reveals that the ratio of gonorrhœa to total syphilis in Canada for that period was approximately 6 to 1. It is apparent, therefore, that the reporting of gonorrhœa by physicians in Canada is very inadequate. There is reason to suspect that syphilis is not being reported completely.

We know definitely that 15,911 cases of syphilis came to attention. Admitting that the ratio of gonorrhœa to syphilis was 6 to 1, it is estimated that in 1944 there were at least 90,000 cases of gonorrhœa in Canada. Of these, only 21,033 were reported by physicians.

The incidence rate of syphilis in Canada is exceedingly high. In 1944 the syphilis rate for Canada was 135 per 100,000 per annum. In 1942, the syphilis rate for Sweden was 7 per 100,000 per annum, the rate for Denmark was 23 per 100,000 per annum and the rate for Norway was 38 per 100,000 per annum. These are three countries which have maintained reliable venereal disease statistics over a period of years.

"Find V.D. Contacts — Report V.D. Cases"

Clinical and Laboratory Notes

NUTRITION SURVEY OF McGILL UNIVERSITY STUDENTS

By C. S. Barker, M.D.

Montreal

During the McGill University session 1944-45, the attention of the University medical officer has been drawn to the question of the nutrition of the students. As the year progressed, several complaints kept recurring among the students who reported for consultation. These complaints were of vague, and sometimes not so vague, gastro-intestinal symptoms, of not getting the right food, of not getting enough food, of the food being poorly cooked and unappetizing, of loss of weight, and of the surroundings in the case of some students coming from outside the city.

It was decided to undertake a nutrition survey of a group of about one hundred students. These students were taken without selection, except that they came to the University medical officer. Some came for consultation it is true, but a considerable number came for re-adjustment of C.O.T.C. categories, etc. It possibly would have been a fairer group if the students had been called in at random from the Unisity, but the loss of time to the students concerned was not felt to balance the advantages of this form of selection.

The objects of the study were as follows: (1) By questionnaire to find out gain or loss of weight, conditions under which the students are eating, their eating habits, presence of digestive troubles and amount of sleep. (2) To determine the caloric adequacy of the student's diet, the distribution of the calories, and the adequacy of accessory food factors—vitamins and minerals. (3) To determine whether the students eating their meals in boarding houses and restaurants were having as satisfactory nourishment as those eating their meals at home.

The accompanying Table I presents the results of the questionnaire.

TABLE I.

QUESTIONNAIRE ANSWERS

	Home students	*Boarding students*
Number	56	47
	%	%
Meals at home, per day	2.1	0
Lost weight	16.0	15.0
Gained weight	16.0	15.0
Complained environment (meals away from home)	7.1	13.0
Complained meals rushed	12.0	19.0
Complained digestive symptoms	11.0	21.0
Ate between meals	40.0	41.0
Hours of sleep	8.1	7.6

In connection with our findings, some points might be mentioned. The complaints about the environment, serving and cooking of the meals are not much higher among the boarders than among the students living at home and lunching out. However, the difference is magnified when one remembers that these complaints among the boarders often are about three meals a day as compared with one meal among the home group.

The question of meals being rushed by the home students is present because of two factors; tardy rising and a short lunch hour. The boarding students may rush their meals because of the same reasons, but it is believed, in some cases, because of lack of congeniality of surroundings. Here again the importance of the three-meal a day factor as compared with lunch only magnifies the importance of surroundings in hasty meals.

The digestive complaints are noticeably more numerous and of a more serious and persistent nature in the boarding group. It is hard for many of this group to obtain a special diet when it is needed.

The results of the questionnaire regarding nutritive intake are tabulated in Table II as averages for different groups.

DISCUSSION

It is apparent from the findings that the diet of this specimen composite group is, for the most part, adequate in the light of present ideas. The students living away from home

TABLE II.

Average	*Protein (gm.)*	*Calcium (mgm.)*	*Iron (mgm.)*	*Calories*	*A (IU's)*	*B_1 (mgm.)*	*B_2 (mgm.)*	*C (mgm.*
Desirable minimum	70.0	800	12.00	2,500	5,000	1.500	2.200	75
Boarders	102.3	1,488	17.61	2,897	8,929	1.785	3.288	112
Home residents	112.0	1,504	16.65	2,906	8,628	1.831	3.184	114
Douglas Hall*	123.6	2,191	18.68	3,272	7,005	1.716	3.985	94
10 lowest boarders	78.0	1,132	13.37	2,083	7,111	1.482	2.352	130
10 lowest home residents	76.2	1,025	12.53	2,248	6,403	1.342	1.079	78
5 lowest boarders	72.4	1,247	11.60	1,855	7,738	1.508	2.463	129
5 lowest home residents	73.5	883	12.25	2,119	5,145	1.037	1.812	54
Lowest boarder	58.4	912	10.18	1,560	8,488	1.139	2.134	147
Lowest home resident	46.6	383	10.55	1,850	7,238	.780	1.004	14

*Douglas Hall is a University Residence.

seem to have a diet as adequate, generally speaking, as those living at home. It is of interest, however, that in the groups of the five lowest boarders and the five lowest home residents calories begin to drop below the minimum for active students in this age group. The deficiency becomes most apparent in the diet of the lowest boarder and the lowest home student. Here, other factors besides calories become deficient. If this group can be considered representative, it becomes apparent that in a university of, for example 3,000 students, 10% or about 300 students are tending to drop below the desirable dietary standards and that 2% or more, that is 60 or more students, are on a relatively poor diet.

It is likely that deficiencies in diet have a certain influence on feelings of well-being, desire to study, partake in athletics, etc. However, proof of this is beyond the scope of the present study. Efforts are constantly being made to improve standards of nutrition by the distribution of available literature and individual advice on the part of the University medical officer. It seems likely that improvement in the knowledge of nutrition on the part of university students can serve to improve this knowledge in the community at large.

Home residents would seem to have certain advantages over the boarders as to their surroundings; home cooking, lack of digestive symptoms, and increased hours of sleep. Probably these factors have a considerable bearing on general health and efficiency, though there is no factual basis at present for this impression. Such proof would be difficult to obtain as many home students do not present themselves to the University medical officer, but rather to their family physicians.

SUMMARY

A nutrition survey of a group of McGill students has shown that the average dietary intake satisfies present minimum standards. There is a certain group, probably around 2 to 5% of the students who fail to satisfy these standards. The above findings are true of both boarders and home residents.

Medical Bldg., McGill University.

Flying is suggested as the one sport guaranteed to take a doctor's mind away from medicine. Fishing allows too much time to think, golf may involve others with whom he can discuss "interesting cases", and even just a visit with friends often calls for minor medical advice.

Flying along three or four thousand feet above sea level, away from telephones, offers a chance for the physician to see the forests instead of the trees. And for the blasé, the *Rocky Mountain Medical Journal* suggests tailspins. There are few doctors who, in the process of tailspins, could think of anything else but tailspins.—*Science News Letter*, August 18, 1945.

Editorial

PREVENTION OF VENEREAL DISEASE

THE war has seen the development in the Army of the most intensive form of health education in venereal disease which has ever been attempted. There has also been serious and sustained education of the public as well, but in the case of the army compulsory methods have been used and the results may be more clearly analyzed.

The question which will be most naturally asked is: how much has this intensive education done to prevent venereal disease in the army? Capt. G. W. Larimore and Lt.-Col. T. H. Sternberg of the U.S. Medical Corps have dealt with the matter in the *American Journal of Public Health* (August, 1945) describing methods used and discussing experiences and results. They point out that the venereal disease education of the soldier is carried on continuously from the time of his induction till his discharge. The program includes every known form of imparting information. On induction a short pamphlet is given him. Then come talks on sex hygiene and venereal disease. These are given by medical officers, combatant officers, and chaplains. Next come instruction by films and another pamphlet. At the basic training centre there are more film strips and talks by officers. When the training period is over and the soldier goes to a unit the instruction is kept up by further talks at regular intervals, together with additional films, pamphlets, posters and other health educational media.

This program received an intensification in January, 1944, because it became apparent that there was then an upward trend in venereal disease in the army. These additional measures included new films and strips, more pamphlets and special posters each month. Other methods were bulletins, charts, prophylaxis station lists, match book folders and other forms of reminders. In all it was estimated that the graphic educational material distributed in the year approached 15 million pieces, with film audiences of about 10 million. With all the other methods included it may therefore be conceded that

the Army program was the largest single health education project ever yet attempted.

It is pointed out however that imparting of technical information is one thing and getting the soldier to be guided by it is another. The first can be done with very considerable success; in the case of the second the authors frankly admit that they "know of no single universally effective appeal to induce the soldier either to avoid exposure or to take prophylaxis". Not but what in given cases, with given conditions of individual mental qualities, there will be encouraging success. But no form of education, even of the most intensive type, and no kind of appeal, even of the most powerful nature, can produce what in the last analysis is the only dependable protection, that is the power of self denial. That is a moral quality and it is slow in growth even with the most devoted efforts to inculcate it.

How then are the results of this vast educational program to be assessed? These authors do not feel that the lower incidence of venereal disease should be the only guide, since other factors contribute to that. Nor is the mere acquisition of technical knowledge a good index; indeed "there was often no significant difference between the knowledge about venereal disease possessed by groups who have acquired it and those free of infection". The conclusion reached is that the best single criterion of the immediate value of this education is the extent to which prophylaxis facilities and materials are used. The current Army requirements were stated to be more than 50 million individual prophylactic items monthly. This must prevent a great deal of disease and must be largely due to adequate instruction.

DEFUNCT ORGANIZATIONS.—A recent issue of the *New York Times* carried an advertisement of the Chase National Bank, listing the names of persons or organizations of unknown address owning unclaimed funds of more than $25. Included in the list were the American Fund for French Wounded, the Friends of Belgium, the Committee for Dewey Arch, the Committee for Reception of Prince Henry, the National Sound Money League, the Babies Shelter Commission and the Non-Explosive Can & Device Company. No doubt the funds deposited for organizations like these were made with the best of intentions or eleemosynary motives. The absence of any claimant to the property is, however, a striking commentary on the facility with which new and poorly conceived organizations initiate their operations and the ease with which funds for almost any purpose can be obtained from credulous persons.—*J. Am. M. Ass.*, **129**: 352, 1945.

Editorial Comments

The Rat Bite Fevers

The effective use of penicillin in the treatment of the rat bite fevers has been noted in several recent papers.[1, 2, 3, 4] It is now generally agreed that the apparently specific reactions which have long been known to occasionally follow the bite of a rat, or of an animal having possible association with these rodents, are in reality two separate diseases. Both are infections, one due to spirillum minus, the other to streptobacillus moniliformis. This fact of a dual etiology helps to explain certain features, previously more or less obscure, in connection with these oddly interesting and not very uncommon conditions.

Many of the cases do not strictly follow the classical lines, and often fail to respond as dramatically as expected to the standard treatment with arsenicals. Spirillum minus was until lately usually accepted as the only causative agent, although actually seldom demonstrated, at least on this continent. Other organisms were occasionally reported, and some observers kept an open mind. Streptobacillus moniliformis is now recognized as the active factor in perhaps most of the cases in North America. It is also the cause of Haverhill fever, which runs a course somewhat similar to that of rat bite fever, but without any history of a preceding bite. The organism is therefore sometimes called Haverhillia multiformis. Another name for it is *streptothrix muris ratti.*

Signs and symptoms in the two forms are generally similar, but certain differences may help to suggest the infecting agent, before the spirillum can be identified by animal inoculation or the streptobacillus by blood culture. An incubation period of a week or more, rather than of days, a definitely relapsing type of fever, a well marked rash tending to vary with the temperature, definite local inflammatory reactions at the site of the bite, and a prompt response to arsenotherapy point to a probable spirillar infection. A short incubation period, absence of local reactions, a variable course and gradual recovery apparently uninfluenced by chemotherapy, and often more or less arthritis, suggests the streptobacillus.

The use of penicillin has been followed by good results in at least nine cases of streptobacillary rat bite fever, a type in which other forms of treatment have not proved satisfactory. It has been equally effective in a patient with

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1. ROBINS, G.: Haverhill fever following rat bite treated with penicillin, *Clinics*, **3**: 425, 1944.
2. KANE, F. F.: Rat bite fever due to streptobacillus moniliformis, *The Lancet*, **2**: 548, 1944.
3. ALTEMEIER, W. A., SNYDER, H. AND HOWE, G.: Penicillin therapy in rat bite fever, *J. Am. M. Ass.*, **127**: 5, 1945.
4. WHEELER, W. E.: Treatment of the rat bite fevers with penicillin, *Am. J. Dis. Child.*, **69**: 4, 1945.

the spirillum minus infection, reported by Wheeler.[4] Penicillin would thus seem to be the therapeutic agent of choice for both varieties of rat bite fever, and presumably also for Haverhill fever. R.C.S.

The University of British Columbia

The war has made a large section of Canada's younger generation "West Coast conscious" to judge from the mounting number of men and women in the forces who are taking their discharge to British Columbia. In one year the enrollment at the University of British Columbia has almost doubled, so that currently we find 5,300 students at that young and vigorous institution. In the next ten years it is possible that some of Canada's most significant educational developments may come from the western seaboard where the B.C. Government has recently voted $5,000,000 for new buildings, of which approximately $1,500,000 will go to house and establish a medical faculty.

The success of a medical school in Vancouver depends on the willingness of everyone concerned with its inception to enquire into new educational methods most rigorously, in order that the best will be used from the beginning of the school. Canada does not need "just another medical school", but rather a medical faculty which will set the pace for all, by its re-integration of the basic medical sciences with the applied medical sciences. The petty jealousies which spring up whenever medical teaching is subdivided and atomized can be avoided if, from the first, a faculty is assembled as a team, not as a collection of luminaries. This is where U.B.C.'s great opportunity lies, in developing from scratch not merely a new medical school, but a new *type* of medical school.

The parallel with the opportunity presented to the Johns Hopkins trustees more than half a century ago is too striking to be forgotten. When Johns Hopkins decided to require a bachelor's degree for entrance, many medical men thought the school doomed from the beginning. And yet the group of young teachers—they were all under forty years of age—who opened the school, against heavy odds, are today looked upon as the originators of many of our basic educational methods in medicine. Let us then give every encouragement to this young university in the West as it enters upon the difficult task of setting up a first class medical school within the next two years. The University administration has wisely determined to survey at once the best teaching methods in Canada, the United States and England. Within a few years we may see the fulfillment of the dream of U.B.C.'s first president, Dr. Frank Fairchild Wesbrook, who died shortly after going to Vancouver after being Dean of Minnesota's medical school. The eyes of Canadian medicine will truly be on Vancouver as it tries to combine in the best the traditions of three great countries.

A Consultant in Medical Economics

The regular fall meeting of the Editorial Committee was marked by the appointment of a new Chairman. Dr. A. E. Archer who has occupied that position for the last two years has resigned to accept the newly created position of Consultant in Medical Economics. His successor is Dr. Harris McPhedran, of Toronto.

For some time past it has been realized that there is a pressing need for some method by which the developments in medical economics can be appraised and interpreted for the members of our profession. Dr. Archer is peculiarly well qualified for this work. He has not only unusually intimate and extensive knowledge on the matter, but also admirable lucidity and balance in setting forth its various aspects. His long experience allows him to speak with authority, but he does not seek to impose his views so much as to inform and explain. His work will of course require constant travelling throughout the Dominion.

Medical Economics

ADMINISTRATIVE EXPERIENCE IN THE DEPARTMENT OF VETERANS' AFFAIRS

[*We publish herewith extracts from a "General and Statistical Review of Recent Administrative Experience" as given by the Hon. Ian Mackenzie, Minister of the Dept. of Veterans' Affairs, before the Special Committee on Veterans' Affairs, Ottawa, October 12, 1945.*

We would call special attention to the last paragraph but one, in which the statement is made that a modified health insurance service is being given to more than 650,000, or about one-third of Canada's male working population. —EDITOR.]

"I made reference some time ago to the broadening of policy with regard to providing medical services to veterans for conditions not related to pensionable disabilities.

"At the present moment the Department of Veterans' Affairs has to be equipped for the following purposes: (1) to provide treatment for all pensioned disabilities; (2) to provide treatment to all discharged members of the forces for any conditions within twelve months of the date of discharge; (3) to provide treatment to all ex-servicemen who have served in a theatre of war for non-pensionable conditions when the veteran is considered unable to provide such treatment at his own expense.

"We estimate the number of disabled pensioners who may require treatment for their pensioned disabilities out of both wars at 100,000. We have records to establish that the proportion of disability pensioners in hospital at any one

time is 6.6%. For this purpose we require 6,600 beds.

"The number of veterans who have had service in a theatre of war in the two wars will, when demobilization is completed, be approximately 800,000. If we take away the 100,000 disability pensioners we have 700,000.

"Our regulations with regard to free treatment assume that any man whose income is less than $100 a month is unable to provide hospital and medical services at his own expense. The Bureau of Statistics reports that approximately 70% of male workers in Canada earn less than $1,250 a year. Seventy per cent of the 800,000 veterans who have served in a theatre of war is 560,000. If we have to provide hospitalization for 1% of that number at one time we shall require another 5,600 beds or a total, adding the 6,600 beds required for pensioners, of 12,200 beds.

"Our present construction program is calculated to increase our capacity in the next couple of years to approximately 16,000 beds but among that 16,000 beds will be around 5,000 which are in obsolescent structures. I need only to mention Ste. Anne de Bellevue, Camp Hill and Christie Street to indicate what is meant.

"I do not believe either Parliament or the public have yet appreciated the extent to which the medical services of the Department of Veterans' Affairs have been expanded by these new treatment regulations. We are in effect giving a modified health insurance service to more than 650,000, or approximately one-third of Canada's male working population.

"I referred a few minutes ago (to) the fact that we have now 4,368 enrolled out-patients. Our out-patient clinics are giving approximately 40,000 treatments a month and a very large proportion of these are for ordinary ailments not specifically related to war service."

OUR NEW FRONTIERS OF HEALTH

[*Extract from an address by the Hon. Brooke Claxton, Minister of Health and National Welfare, October 29, 1945.*]

"Everyone acknowledges the need of extending health services in Canada; everyone says that something must be done; and the ground of discussion is on the best means to reach objectives on which there is general agreement. The Dominion Government has made four specific proposals for providing nation-wide health services for all the people of Canada. These will be found on pages 27 to 42 of the 'Proposals of the Dominion Government', put before the Conference. The four proposals are summarized here—

"The first is that the Dominion should make grants to the Provinces totalling $620,000 to be spent on planning health services.

"The second proposal is for a nation wide but provincially administered system of health insurance to be introduced in two stages. The provinces participating would agree to institute within two years the first stage of general practitioner services, hospital care and visiting nursing services. The second stage would be the establishment of the remaining services necessary to provide complete health service within an agreed period. The estimated cost would be $10.20 per individual for the first stage and $11.40 for the second or $21.60 annually for complete service for everyone.

"To this the Dominion would contribute about 60% of the cost. An important feature of the plan is that the provinces would be able to introduce the services in each stage at different times and in different localities. The proposal has, therefore, the element of flexibility which was so strongly urged by the provinces at the meeting in May, 1944. The plan recognizes that health insurance has to be administered by the provinces. Also, it recognizes the existing personal relationship between doctor and patient. That is, the patient would be able to choose his doctor. The plan would provide a greater number of doctors with a much higher average remuneration that they have ever had.

"I had previously discussed health insurance in a general way when I made a trip across Canada in February and March, 1945. From discussions held during the Conference, I believe that, if the general Dominion proposals are agreed to, we could very speedily arrive at agreement with the provincial health authorities on the various details.

"The estimated cost of the whole first stage is $100,000,000 per year and the total cost would be $250,000,000 per year, to which the Federal Government would contribute approximately $150,000,000 and the provinces' share would be $100,000,000. That is for the full service for everyone in Canada. Naturally this would not be attained for a number of years. Estimates of the costs and payments are in the Proposals and Reference Book.

"The estimated cost of these health services does not mean that this expenditure will all be new. The best estimate we were able to make shows the present cost of medical care is $250,000,000 a year, that is the same amount as the estimated total cost of the health insurance plan when fully introduced everywhere in Canada. The planned organization of health services would result in the money going further. Health insurance has been widely adopted in many other countries because it is regarded as the best means of meeting the cost of illness and distributing it fairly.

"The third proposal is that we grant the provinces for preventive medicine sums which might total $13,000,000. These grants are listed on pages 34 and 35 and are:

	Present Maximum
General Public Health	$4,022,600
Tuberculosis	3,000,000
Mental Health	3,987,000
Venereal Disease	499,500
Crippled Children	497,900
Professional Training	250,000
Public Health Research	100,000
Civilian Blind	1,243,900

"We are paying pensions to the blind at age forty on the same conditions as old age pensions as at present, that is with the means test. Seventy-five per cent of the cost is borne by the Federal Government and 25% by the provinces. Subject again to satisfactory arrangements with the provinces, it is the intention of the Federal Government to pay pensions to the blind beginning at the age of 21. We also aim to work out with the provinces arrangements whereby under certain conditions funds or services will be made available for the treatment of the blind.

"The fourth proposal we made with regard to health is to assist the provinces, municipalities or local agencies in building hospitals by making loans at cost. It is estimated by the Canadian Hospital Association that we need $125,000,000 worth of hospitals in Canada to provide essential service and that another $65,000,000 worth of construction will be needed within 10 years.

"These proposals taken together with what we are already doing constitute a pretty big program of health services for the Dominion and the provinces. If the Dominion Government's proposals are carried out they should, we hope, put Canada in the leadership of the world in matters of public health."

Men and Books

HISTORY OF FRENCH UROLOGY*

By J. P. Bourque, B.A., M.D.

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Urology, which has a very definite place among the surgical specialties of our times, has had a very modest debut. We may even say that before the eighteenth century urology was almost completely ignored and even opposed by all the medical schools, in all countries. In ancient times and throughout the Middle Ages, it was left in the hands of ambulant or vagabond surgeons, who performed two kinds of operation: the catheterization of retention bladders and the extraction of bladder stones. The fact that the patients suffering from one of these two conditions was condemmed to certain death, and this, in a very short time, most likely accounts for the lack of interest showed in urology by the surgeons of the first eighteen centuries of our era.

Even with the bad reputation of early urological surgeons, a few great names have survived the ages and are known to all of us. Without any prejudice, because history is made out of facts, I will recall to you the main figures who were the pioneers of urology and who, by their achievements, made this science what it is today. The history of French urology is the history of urology itself because most of its data were brought to us by French surgeons.

The first important observations in urological science were made by Pitard in 1250; it was the first serious study of the anatomy of the human kidneys, ureters and bladder and was based on facts observed and described by the dissection of these organs.

In 1361, Guy de Chauliac, although not the first surgeon to perform perineal median cystostomy for extraction of bladder stones, because this operation was performed many centuries before his time, was the first surgeon to give a clear and detailed description of the technique of this operation. Ambroise Paré, the father of surgery, completed this description in 1540, although his observations were only theoretical, because he never performed the operation himself.

The first suprapubic cystostomy was performed in France by Franco in 1560 but as the results were disastrous, this technique was not employed again for almost two hundred years.

In 1697, Jacques de Beaulieu, better known under the name of "Frère Jacques" introduced a modification to perineal cystostomy. Instead of using a median incision, he performed a lateral one which brought better results because the hæmorrhage was less abundant, the urethra was not traumatized and the healing of the wound was much faster.

Jean Louis Petit who described the anatomical triangle situated in the lumbar muscular region which is still named after him, invented the first curved catheter, which was built in 1700, and it was adapted to the normal anatomical direction of the male urethra.

Then came two surgeons, Rousset of Montpellier and Jean Baseilhac known as "Frère Côme" who between 1727 and 1755 brought the technique of the perineal and the suprapubic cystostomies to the highest degree of perfection attainable before the development of antiseptic and aseptic surgery. As a matter of fact Frère Côme obtained an international reputation by his successful performances of cystostomies for stone extraction.

These operations, brilliant as they were for this period, when performed by specialists, still continued to have disastrous results when performed by less skilful performers. This is the

*Read at the Seventy-sixth Annual Meeting of the Canadian Medical Association, Section of Urology, Montreal, P.Q., June 13, 1945.

reason which led the surgeons to find a less serious operation to remove stones from the bladder, and brought about the development of lithotrity, and it was the improvements in this during the nineteenth century which saw the real birth of urology. It is during those years, that urological surgery began to be individualized as a specialty. In fact, we will see that the nineteenth century saw the establishment of the basic foundations of pathological, surgical and instrumental knowledge which, in some cases, have undergone no changes up to our era of modern urology.

The first name to be noticed in the nineteenth century for his achievements was Civiale who on January 13, 1824, in Paris, performed the very first lithotrity or the crushing of a bladder stone. He performed the operation with an instrument called the lithontriptor, which consisted of four branches in between which the stone was caught and crushed. In 1832, Heurteloup invented the first real lithotritor with two branches sliding into one another, thus permitting the grasping of the stone, which was then crushed by percussion on the inner branch with a small hammer. Charriere one year later perfected this instrument by the addition of the screw on its handle.

In 1834, Leroy d'Etiolles invented the urethral explorators of different sizes, by means of which he was able to estimate the calibre and the number of urethral strictures. He went further and was the first surgeon to invent an instrument to remove the prostatic adenoma through the urethra, by means of a cutting noose wire, thus being a pioneer on the transurethral resection of the prostate. In the same year, Mercier invented the elbowed-end catheter which is still in use, without having been modified. In 1836, Nelaton invented the rubber catheter which still bears his name. In 1841, Mercier of whom I have just spoken, was the first urologist to give a clear and precise description of the prostatic adenoma, with its median and lateral lobes and the rôle played by these lobes in the retention of urine, whether partial or complete. During these same years, Beniqué invented his metallic double-curved dilatators which are still utilized for the dilatation of urethral strictures.

In 1853, Antonin Desormeaux, although not the first urologist to conceive the endoscopic exploration of the bladder, introduced the first practical cystoscope, and in his *Traité de l'endoscopie* written in 1865, described many aspects of the pathological bladder; although it is with the Austrian urologist Nitze, who introduced his cystoscope in Vienna in 1879, that cystoscopy attained its real development.

In 1855, Maisonneuve invented his urethrotome for internal section of urethral strictures and presented it to the Academy of Medicine. This urethrotome was so simple and so easy to manœuvre, that it is still frequently employed by urologists of all countries and, in our opinion, it has not been surpassed yet by any instrument built for the same purpose since then.

All the personalities whom I have just recalled and whose improvements in urology I have reviewed, were general surgeons. In fact it was with the arrival of Felix Guyon at Necker Hospital in Paris, on July 9, 1867, that urology started to undergo so many improvements and that it really could claim its own place among the surgical specialties, a place it has held since then.

Guyon, the father of urology, of whom the German urologist Israël, at the international meeting of urologists held in 1910 said that, "all the urologists of the world were his pupils", was the first surgeon to give all of his life to the development and to the scientific improvement of urology; so much so that in 1890, his teaching was recognized officially by the University of Paris and Guyon was appointed professor of urology. The contributions to urology by Guyon are so numerous and important that it would be inexcusable not to mention all of them. He described the clinical symptoms of papilloma and of cancer of the bladder. He gave a very definite description of bladder distension and its repercussion on the kidneys, and also analyzed very precisely the subsequent intoxication caused by the rising of urea in the blood. His clinical studies of cancer of the prostate and especially of the prostato-pelvic carcinoma are still classical. The physiology of the contractions of the normal and of the pathological bladder had no secrets for him and that is one of the reasons why he was recognized during nearly thirty years as the master of lithotrity; in fact his mortality rate in this special operation never rose above 2%. Guyon also established definitely the technique of internal urethrotomy, by setting an indwelling-catheter in the urethra following the operation, and thus brought down the mortality rate of this operation from 60% to 2%. He gave a complete clinical description of urinary septicæmia. He also described the best way to make a good bi-manual palpation of the kidneys, which is today a matter of routine to all of us. He brought the technique of suprapubic cystostomy to such a degree of perfection that we still perform this operation in accordance with it. Guyon also proposed the two-stage operation in traumatic ruptures of the urethra in cases where there is extensive injury to adjoining tissues. All of his conceptions were clearly set forth in the book he wrote on clinical urology, entitled *Leçon cliniques*, which for many years was the gospel of urology. We owe all these great achievements, which were the foundations of modern urology, to this great urologist, Felix Guyon, whose name will always be associated with our specialty; and, let us hope that we will never forget this scientific father of us all.

In 1906, Guyon retired and Albarran, his most beloved pupil and collaborator, was ap-

pointed to succeed him. Albarran continued the work of his master and although his career was very short, his scientific achievements equalled, if not surpassed, those of his predecessor.

Albarran although a Cuban by birth, was French by adoption and it was in Paris that he received his whole medical education and that all his achievements were made. The contributions of Albarran are so numerous and so important, that no urologists can afford to ignore them. He gave such an impulse to urology that most of his observations are still up-to-date, forty years after he established them.

In 1888, he described the rôle played by the colon bacilli in the infections of the urinary tract. In 1892, he explained the mechanism of the formation of hydronephrosis, and made an elaborate study of perinephritis, showing that this could be of two types, that is, consecutive to a renal infection or to a generalized infection. The year 1897 saw the greatest achievement of Albarran and, even if it had been his only one, it was in itself sufficient to immortalize his name; this great innovation was the adaptation of the cystoscopic lever to the Nitze cystoscope, which rendered possible the catheterization of the ureters and thus opened the way to the complete exploration of the urinary tract. In 1898, he described the pathology of the urinary abscess and the rôle played by anaerobes in this type of fulminating infection. In 1900, he published his histo-pathological findings on the pathological prostate and showed that benign hypertrophy was in reality the hypertrophy of the peri-urethral glands of the prostatic urethra, and that the prostatic carcinoma had its origin in the prostate gland itself. In 1901, he established the final points in the technique of perineal prostatectomy and in 1908, he was able to publish his first hundred cases with but 2% mortality. In 1902 he gave the first clear description of tumours of the kidney and of the pelvis, and also showed the different ways by which the kidney could be infected by tuberculosis. In 1905, Albarran demonstrated the wonderful results obtained by early nephrectomy in renal tuberculosis. In this same year he promulgated the first physiological laws concerning the elimination of urea by the kidneys. Finally in 1909, three years before his death, he published a volume on genito-urinary surgery entitled *Médecine opératoire des voies urinaires*, which was the completion of his very brilliant career, and still stands as one of the greatest urological documents of the first years of our century.

Albarran's personality was so great that he almost makes us forget the achievements of other French urologists, who also contributed largely to the advancement of urology.

Tuffier, in 1887, demonstrated the possibility of nephrectomy, by showing that the remaining kidney had enough power of compensation to allow a normal life, after that operation. He also demonstrated that nephrostomy could be performed without any danger as long as momentary compression was applied to the renal vascular pedicle, and he established the best technique to suture the incision on the kidney itself. A few years later, he described capsular nephropexy and also the best way to open the ureter and suture it afterwards, in order to avoid urinary fistulas, thus opening the way to the surgery of the ureter.

In the same year Pasteau introduced the graduated ureteral catheter thus enabling the operator to know exactly to what distance the catheter is introduced in the ureter.

Albarran, outside of his great personal achievements contributed by his teaching to the scientific training of many urologists who continued his work. Among these were Legueu, Luys, Chevassus, Heitz-Boyer, Papin, Jeanbrau, Lepoutre and the great Marion, who were the greatest urologists to follow in the steps of Guyon and Albarran.

In 1913, Legueu was appointed professor of urology and started where Albarran had left off. Among his main achievements we have the establishment of surgical indications in the surgery of renal lithiasis, and the application of local anæsthesia to prostatectomy, thus enabling urologists to operate on patients who could not have survived the postoperative complications of general anæsthesia which was not so well developed in those days. Legueu also made great contributions to the study of the renal secretion, to the surgical treatment of urethral strictures and to the surgery of the ruptured urethra. His book entitled *Traité d'Urologie* was the completion of his master's publications.

In 1913, Luys performed the first transurethral removal of the prostate and called this operation the "forage" of the prostate which in fact, was the point of departure of the transurethral resection of the prostate so well improved and perfected by the American school of urology.

Chevassus who is mostly known for the classification of tumours of the testicles which he published in 1906, and which is still referred to, was actually the first urologist to apply to urinary surgery the laws of Ambard who established the relation existing between the blood urea and the urea in the urine. Chevassus also contributed largely to the study of ureteropyelography.

Heitz-Boyer, considered as the most beloved pupil of Albarran, was the first urologist to practise electro-coagulation of papillomas of the bladder through the cystoscope.

Papin, another disciple of Albarran, contributed largely to the improvement of Volker's and Lichtenberg's pyelography introduced in 1906. His greatest achievement though, was his masterly study of the congenital malfor-

mations of the kidneys and ureters, which has not been surpassed yet. The same applies to his observations on hydronephrosis. To surgical urology he brought new techniques of pyelotomy and of hemi-nephrectomy, and he introduced the denervation of the kidneys.

Jeanbrau, professor of urology at the University of Montpellier, made a large contribution to the diagnosis and treatment of ureteral stones.

Lepoutre, professor of urology at the University of Lille, under whom I studied, made a marvellous study of the ruptured urethra and his book entitled *Les ruptures de l'urèthre* published in 1934, is still the best work published on this subject. With Pillet of Rouen he was the first urologist to promote the palpation of the kidney in the vertical position and also the making of pyelograms in this position. Lepoutre also published two books on surgical urology.

Ombredanne, although not a urologist, has created two very brilliant techniques, one for the cure of penile hypospadias on children and the other for the scrotal orchidopexy in cases of ectopy of the testicle. Duplay also introduced a technique which is employed by all urologists for the cure of hypospadias.

We come now to the greatest disciple of Guyon and Albarran who since 1908 has been the outstanding master of French urology. His name is Georges Marion. He headed the department of urology at Lariboisière Hospital in Paris from 1908 to 1931 and then the same department at Necker Hospital after he was appointed professor of urology at the University of Paris where I had the opportunity to listen to his marvellous lectures which were so brilliant in their precision and so remarkable in their clearness of exposition.

Marion's publications were so numerous that it is impossible to speak of them all. His main ones were his *Précis de thérapeutique urinaire* published in 1910, his *Leçons de chirurgie urinaire*, published in 1912, and a few years later, his *Traité pratique de cystoscopie et de cathétérisme urétéral*, which he wrote in collaboration with Heitz-Boyer, and which was the first of its kind to be published in the world. This manual has been at the base of teaching of the different aspects of pathological conditions of the bladder observed through the cystoscope. After the last war came his *Traité d'Urologie* in two volumes which has been edited three times since, and is surely the best of them all. This manual, although written by Marion alone, can compare with any other manual written in collaboration by many urologists. He also published his *Manuel de technique chirurgicale*, and in 1936 appeared his book entitled *Quelques vérités premières en urologie*.

Marion, apart from being a marvellous teacher has created many new surgical techniques which are now widely used the world over. I will recall the principal ones. First came his "enlarged pyelotomy" in which the incision includes both the pelvis and the renal parenchyma and permits us to remove large stones from the kidney easily and with no danger. He promoted a new technique for nephrostomies for drainage of the kidney, with the use of Tripier's dilatation conductor. His greatest gift to renal surgery was the management of the renal vascular pedicle during nephrectomy, when the latter is torn off or slips. Unbelievable as it may seem, I have, with many of his other pupils, seen him purposely tear away the renal pedicle to show us what to do in such a case to control the hæmorrhage and save the patient's life. Marion also contributed largely to the amelioration of the post-operative treatment following prostatectomy, with the different drainage tubes he has devised. In 1913, he devised his own technique for the resection of bladder diverticula. A few years later he described his own technique for the transvesical surgical cure of vesico-vaginal fistulæ; a technique which, if well followed, enables urologists to obtain a certain cure in nearly a 100% of cases; he also published a technique by means of which we can cure the female patients suffering from incontinence of urine, by shortening the vesical sphincter. Marion also contributed largely to the surgery of the urethra. In this field his circular urethrorraphy is still the operation of choice for the treatment of traumatic rupture of the posterior urethra. Finally Marion devised an excellent technique for the surgical cure of hypospadias.

I have summarized very briefly the main achievements brought to us by the French school of urology. As we can see, they are so numerous and so very important that without exaggeration, it is possible to say that no other country has done so much for our specialty.

As a conclusion to this brief review of facts, may I take the liberty to suggest that all Canadian urologists who have received their training either in Canada, in France, in England, or, in the United States, should join up together, take the best out of these schools and thus by working hand in hand in a spirit of "bonne entente", create a Canadian school of urology which in my opinion could attain the highest point of efficiency and be surpassed by no one.

934 Cherrier St.

We must not require too much of those who are willing to serve us; we should never misuse anyone's courtesy, nor over-ride a willing horse. "If your friend be sugar, you must not eat him all up."—Hebrew proverb.

Medical Societies

Calgary Medical Society

At the monthly meeting of the Calgary Medical Society, held on November 6, 1945, at the Belcher (military) Hospital, when Dr. L. G. Alexander, M.C., M.B.E., gave a most interesting talk on his experiences in the Sicilian and the Italian campaigns, where he was Medical Officer to the Calgary (14th) Tank Battalion, and in the invasion of Normandy, and through to Germany when in charge of an advanced dressing station.

Lieut.-Col. R. W. Boyd, R.C.A.M.C., Consultant in Radiology at Ottawa, spoke about "The scientific achievements, which led to the discovery of the x-rays". Many slides were shown of the scientists who from the early seventeenth to the late nineteenth centuries had some part in the gradual evolution of the x-rays, until the epoch making discovery of these rays by Roentgen in 1895.

The Hamilton Academy of Medicine

The Hamilton Academy of Medicine held its first meeting in the present session on September 26. A dinner was the prelude to an address "A twenty-five year retrospect of infant feeding" by Alton Goldbloom, B.A., M.D., C.M., F.R.C.P.[C.], Associate Professor of Pædiatrics, McGill University. The Academy has its scientific programs arranged for three months to come and the enthusiasm of this first meeting ensures a profitable series.

La Société Médicale de Montréal

Les "Journées Médicales de Montréal", qui eurent lieu les 22, 23, 24 et 25 octobre dernier, à l'hotel Windsor, sous la présidence du Dr Paul Letondal, se terminérent avec éclat par un Banquet, où près de 1,000 convives s'étaient donné rendez-vous pour voir et entendre Georges Duhamel, membre de l'Académie française.

M. Duhamel, s'inpirant de l'exemple de la vie d'un grand savant français qu'il a connu intimement, Charles Nicolle (1866-1936), prononça une conférence intitulée: "Médecine et Humanisme". L'éminent écrivain de réputation mondiale, qui venait pour la première fois au Canada, était accompagné de Madame Duhamel. Parlant au nom de la Société Médicale de Montréal qui organisait ces Journées Médicales, le Dr Letondal exprima à M. Duhamel les sentiments de profonde gratitude de la profession, pour avoir bien voulu accepter de présider à l'ouverture de ces importantes assises et d'être l'hôte d'honneur au Banquet de cloture.

Présenté par son Honneur le Maire de Montréal, M. Camillien Houde, le conférencier fut remercié par l'honorable Albini Paquette, Ministre de la Santé et du Bien-Etre Social de la province de Québec, qui était le président d'honneur de la soirée.

A l'occasion de son Banquet Annuel, la Societe Médicale nomma *membres honoraires*: les docteurs Georges Duhamel (de Paris), Charles De Blois (de Trois-Rivières), Hector Cypihot, J.-A. Baudouin et E.-C.-J. Kennedy (de Montréal).

JEAN SAUCIER

Manitoba Medical Association Annual Meeting

The annual meeting of the Manitoba Medical Association (Canadian Medical Association, Manitoba Division) was held in the Royal Alexandra Hotel, Winnipeg, September 25, 26 and 27 with Dr. Stuart Schultz, of Brandon, presiding. As of yore there were wise men from the east who were welcomed both because of their own personality and for their valuable contributions to the scientific program. Dr. Léon Gérin-Lajoie, president of the senior organization, was completing his tour of the west, but had a tour of the Maritime Provinces before him. Dr. A. E. Archer and Dr. T. C. Routley were familiar visitors; Dr. W. G. Cosbie, Toronto, had addressed Manitoba physicians a few years ago, but Dr. John Hepburn, Toronto and Dr. H. G. Pretty, Montreal, were first time visitors to an annual meeting.

Twenty-five leading Canadian pharmaceutical and biological houses, surgical equipment and x-ray manufacturers, were represented in an attractive commercial exhibit.

Dr. Philip Levine flew from New York to present a paper on "The importance of Rh factor". Dr. Bruce Chown, Winnipeg, who under a grant from the National Research Council, is studying this problem in Manitoba, also spoke.

Guest speakers at the luncheon meetings were Dr. Léon Gérin-Lajoie who spoke of the present condition of medicine in Canada; Dr. A. E. Archer, on "The challenge of medicine"; and Pte. John Campbell of the Winnipeg Grenadiers who recently returned from almost four years' imprisonment in Hong Kong.

Through the courtesy of Charles E. Frosst and Co., a colour motion picture film, "Technique in trauma" by Drs. Ackman, Gurd, Gerrie, Mills and Fisk, of Montreal, was shown on September 27.

Clinical programs were presented in the Winnipeg General Hospital on September 25 and in St. Boniface Hospital on the following day. The annual golf tournament was held on September 27 at Southwood Country Club. Low scorer was Dr. C. M. Clare.

The following officers were elected: *President* —Dr. P. H. McNulty, Winnipeg; *First Vice-*

president—Dr. J. R. Martin, Neepawa; *Hon. Secretary*—Dr. D. L. Scott, Winnipeg; *Hon. Treasurer*—Dr. A. M. Goodwin, Winnipeg; *Rural Members of the Executive at Large*—Dr. E. K. Cunningham, Carman; Dr. A. F. Menzies, Morden.

The report of Manitoba Medical Service covered the first year of operation of this medical prepayment scheme. Contrary to experience elsewhere, Plan B which provides complete medical service outsold Plan A, surgical service only, 87 to 13. At the end of July, 1945, over 19,000 persons were insured, 252 doctors are enrolled. During the seven months of 1945 Manitoba Medical Service paid approximately 65% of the schedule of fees set up by Manitoba Medical Association. The final revision of the Constitution of the Association was printed and distributed to members. In his report as Chairman of the Committee on Maternal Welfare Dr. S. Kobrinsky suggested that legislation might be secured to have compulsory autopsies in all cases of death associated with pregnancy. He recommended that a uniform system of identification of new-born babies be adopted by all hospitals in the province.

Medical Society of Nova Scotia

The ninety-second annual meeting of the Medical Society of Nova Scotia was held at the Cornwallis Inn, Kentville, N.S., October 9 to 12, 1945.

The commercial exhibits were a new feature of the meeting. They were excellent and attracted considerable attention. One hundred and forty-seven physicians registered, of whom 48 were from the armed forces. The program was varied and highly interesting. Outside speakers were: Dr. Léon Gérin-Lajoie, Montreal; Dr. C. A. Gauthier, Quebec; Dr. A. E. Archer and Dr. T. C. Routley, representing the Canadian Medical Association; also Dr. G. Gavin Miller and Dr. Carlton B. Peirce, Montreal.

Besides the scientific program a business section covered an unusual amount of work.

H. L. SCAMMELL

Montreal Medico-Chirurgical Society

The thirteenth annual Clinical Convention of the Society was held in the week of October 22 to 27, with the largest attendance it has yet had. The development of this annual convention has been notable. It began as a two-day meeting in two or three hospitals and now has become established as a full week of clinical instruction at practically all the English hospitals in the city. It is not easy to condense an account of such a meeting except into very general terms, which may well be summed up in the one word of success. The presentation in each hospital varied enough to avoid monotony whilst maintaining a consistently high standard. This was especially seen in the panel discussions. These have been developed so as to provide an extraordinary amount of information in a short time and in a stimulating and provocative manner. Some of the subjects covered in these panels were colonic obstruction; hypertension and its sequelæ; penicillin in skin grafting; elimination of colostomy in low bowel tumours; treatment of rheumatic fever; the pneumonias; lymphadenopathy; practical aspects of allergy; jaundice; rheumatoid arthritis; bronchiectasis, hormones in obstetrics, and a large variety of other subjects.

Perhaps the focus of the meeting lay in the dinner held on Wednesday evening. The program Committee under the able leadership of Dr. G. S. L. Brown hit upon the pleasant topic of Hobbies for Doctors. There may have been some who looked forward to this form of entertainment with some curiosity, but there could have been very few of the large assembly to whom it was not an exceedingly pleasant evening. Nine men were chosen to speak on given topics and the effect was unusually refreshing. The kaleidoscope of the various aspects was most skilfully turned and adorned by the chairman, Dean D. L. Thomson, who himself completed the picture with a comment on detective story reading as a hobby. The contemplative pleasures of fishing; the moving ocean under the sailing boat; the quick flight of the ducks on the marshes; these formed a warm and vigorous background to the more highly sophisticated charms of collecting discussed by Dr. D. S. Lewis; of painting under the masterly and pleasing skill of Dr. E. Tremble, followed by the cleverly arranged musical sketch by Dr. B. Stern. Dr. Mortimer conducted the audience again to out of doors life in his praise of the leisurely and yet healthy pursuit of riding, whilst Dr. Tees spoke of the delights of photography, the youngest of all the hobbies of the evening.

The Society also had as its guest Lieutenant-Colonel E. L. LeSoeüf of the Australian Army Medical Corps. Colonel LeSoeüf had been former President of the British Medical Association of Western Australia, and was on his way home after having spent the last three years of the war as a prisoner of war in the hands of the Germans.

New Brunswick Medical Society

The 65th annual meeting of the New Brunswick Medical Society, Canadian Medical Association, New Brunswick Division, was held in Edmundston October 2 and 3. Over 100 doctors were in attendance, many accompanied by wives and daughters. The weather was spotty, cool, wet and finally snow and ice—but the spirit of the meeting was always warm and the entertainment both scientific and social was of a quality expected from our President Dr. P. C. Laporte, M.B.E., and his committee of doctors

from the "Republic of Madawaska". From the moment of official welcome by Mayor J. H. Proulx, of Edmundston, till the last visitor left for home each hour was filled with interest and good fellowship and novel entertainment provided by the local host branch society. The date of meeting in the late fall was due to a request that the three Maritime Medical Societies run their meetings in sequence to accommodate our distinguished visitors. In addition to the C.M.A. President Dr. Léon Gérin-Lajoie and Dr. Routley (an honorary member of the N.B. Medical Society) and the speakers of the scientific program, many notable physicians from the nearby parishes of Quebec and the State of Maine were in attendance. Bilingualism was a feature in addresses, discussion, repartee and story telling.

The business session heard the reports of the Executive Committee and Secretary, Treasurer, Registrar of Council, Workmen's Compensation Committee and audit committee. All showed a lusty condition of society health.

Dr. A. F. Vanwart our member on the Executive Committee of the C.M.A. reported on C.M.A. matters in general and particularly on the health insurance and medical economic situation.

Dr. J. R. Nugent read an interesting report on the cancer situation in the province and forecast necessary advances now possible that the war is over.

Workmen's Compensation fees received their usual annual overhaul and it was desired that a composite fee for fractured jaws include a fee for the surgeon and dentist. Difficulties in classification of dermatitis in industry was also discussed. Silicosis is also becoming a Workmen's Compensation Board problem in New Brunswick.

Sickness and accident insurance for doctors as a special class was introduced and this will be studied by a special committee this next year.

Apprenticeship of medical students in their holidays at the conclusion of the third year of the medical course was introduced by a letter from the Dean of the Medical Faculty of Dalhousie University.

Dr. P. C. Laporte presented a design for the official emblem of the society and this was approved. The emblem embraces the coat of arms of the Province of New Brunswick superimposed on a caduceus carrying two serpents entwined upon it and surmounted by a torch, the whole backed by maple leaves. This emblem headed the Certificate of Honour designed by Dr. Laporte for presentation to all doctors from New Brunswick who have served in the Medical Corps of our country during this recent war.

Lieut.-Col. J. P. McInerny won the annual competition for the VanWart Golf Trophy by a closely guarded score. The cup was presented to Dr. McInerny in a neat speech by another golfer Dr. W. W. Fleck.

At the annual luncheon Dr. P. C. Laporte read his presidential address, a philosophical plea for a greater degree of Christian tolerance throughout our Canadian life and especially in our lives as physicians. Dr. Léon Gérin-Lajoie addressed the society as president of the C.M.A. He stressed federation with tolerance. Dr. T. C. Routley, as usual our guide, counsellor and friend told some new stories and advised early action with our Provincial Government on matters relating to Health Insurance and Provincial Federal Finance.

Election for 1945-46 resulted as follows: *President*—Dr. E. W. Lunney, Saint John; *First Vice-president*—Dr. W. S. Fitzpatrick, Moncton; *Second Vice-president*—Dr. D. A. Thompson, Bathurst; *Treasurer*—Dr. A. L. Donovan; *Secretary*—Dr. F. C. Jennings; *Executive Committee*—Drs. Geo. Dumont, E. O. Thomas, W. Ross Wright, Thos. Nugent, P. M. Atkinson, Geo. Skinner, Maurice Veniot and D. Albert; *Workmen's Compensation Board Buffer Committee*—Drs. W. J. Baxter (chairman), J. R. Nugent and Geo. White; *Cancer Committee*—Drs. J. R. Nugent (chairman), E. W. Lunney, J. M. Barry, J. S. Hynes, F. C. Jennings and H. L. Ripley; *Golf Committee*—Drs. A. F. Vanwart (chairman), V. D. Davidson, W. S. Fitzpatrick; *Additional Members C.M.A. Council*—Drs. A. F. Vanwart, Geo. White, D. T. Thompson, R. W. L. Earle, Geo. S. Skinner, H. E. Britton and P. C. Laporte; *C.M.A. Nominating Committee*—Dr. Geo. White, Alternative, Dr. H. S. Everett; *C.M.A. Executive Committee*—Dr. A. F. Vanwart, Alternative, Dr. Geo. S. Skinner; *D.A.C. Chairman*—Dr. A. S. Kirkland; *Divisional Representative C.M.A. Editorial Board*—Dr. A. S. Kirkland; *Members of N.B. Medical Council*—Drs. R. W. L. Earle, H. E. Britton, A. S. Kirkland, J. R. Nugent and P. C. Laporte; *Honorary Life Member N.B. Medical Society*—Drs. J. M. Barry and A. R. Myers; *Nominations to C.M.A. Standing Committee*—Archives: Dr. J. S. Hynes; Bylaws: Dr. J. R. Nugent; Economics: Dr. A. F. Vanwart; Credentials and Ethics: Dr. R. Roach; Maternal Welfare: Dr. Geo. White; Medical Education: Dr. W. O. McDonald; Nutrition: Dr. H. S. Everett; Public Health: Dr. A. Melanson; Industrial Medicine: Dr. V. D. Davidson; C.M.A. Membership, Dr. Geo. Skinner.

The scientific program was especially good and there was an unusually constant almost full attendance for each paper. Various presidents of Branch Societies acted in rotation as chairman for the scientific paper. This innovation was popular.

1. "Surgical treatment of peptic ulcer", by Dr. Gavin Miller, Montreal.

2. "The influence of pregnancy upon certain pre-existing neurological syndromes", by Dr. C. A. Gauthier, Quebec City.

3. "L'anæsthesie mixte pentothal protoxyde d'azote ethylene cyclopropane", by Dr. Fernando Hudon, Quebec.

4. "Consideration of two cases of primary amenorrhœa", by Dr. Léon Gérin-Lajoie, Montreal.

5. "Je lutte pour vivre sainement: je vis pour lutter sagement", by Dr. Maurice Langlois, Quebec.

6. "Bronchogenic carcinoma", by Dr. Carleton B. Peirce, Montreal.

A. S. KIRKLAND

Ontario Medical Association

District No. 1

Dr. Magner, President-Elect of the O.M.A. could not be in two places at the same time so chose Windsor, much as he would have enjoyed being in Fort Erie on October 2 and 3. District No. 1 had a very successful business meeting in the Prince Edward Hotel. The second day was taken up with a scientific program in Grace Hospital. Dr. C. S. Sanborn presented cases illustrating problems in endocrinology.

Dr. F. R. Guest showed cases of burns to illustrate modern methods of treatment and Dr. Roscoe R. Graham, of Toronto, held a diagnostic clinic. The overflow from this meeting were given surgical clinics in the operating room by Drs. L. G. McCabe, Norman McCormick, D. Davidson and R. J. Coyle.

District No. 4

Ontario Medical Association District No. 4 had a two day session in Fort Erie, October 2 and 3. The first day was given to the consideration of a long agenda of business matters. The morning of the second day was spent at the New York State Hospital for Cancer in Buffalo. After luncheon in Fort Erie papers were read by Dr. Clayton Greene, Professor of Medicine, University of Buffalo, on "Gastrointestinal carcinoma"; Dr. G. E. Richards, of Toronto, on "The modern management of cancer of the breast"; Dr. G. Sheehan of the New York State Cancer Clinic on "Hodgkin's disease", and by Dr. W. G. Cosbie, of Toronto, on "The early diagnosis of cancer". The guest speaker at the annual dinner was the Hon. Dr. Vivian.

District No. 10

The Lakehead physicians had a wonderful time in Fort William and Port Arthur on September 6, 7, 8. The annual summer school was combined with the meeting of District No. 10 of the O.M.A. Three days of clinics and lectures in McKellar Hospital and St. Joseph's Hospital richly rewarded the large number who came to the demonstrations. Dr. Wm. Magner, of Toronto, dealt with problems in pathology and, at the business meeting of the district gave an address in his capacity of President-Elect of the O.M.A. His topic at the evening meeting September 7 was "Jaundice". Dr. R. D. McLachlin, Professor of Surgery, University of Western Ontario, gave clinics in both hospitals and gave lectures on "Advances in pre- and post-operative treatment" and "Civilian lessons from war time surgery". Dr. A. G. McGhie and Dr. C. K. Stuart, of Hamilton, gave clinics on Medical Cases. Dr. McGhie gave a lecture on "Differential diagnosis of chest pains" and Dr. Stuart spoke on "Hyperthyroidism and thiouracil".

A social evening preceded by a dinner at the Fort William Country Club brought a happy ending to a most successful and profitable session.

Academy of Medicine, Toronto

The opening meeting of the 1945-46 session of the Academy of Medicine, Toronto, was held on the evening of October 2. Two hundred Fellows of the Academy dined in Osler Hall and a number of distinguished guests were at the head table. The presidents of the Hamilton Academy and the Toronto Academy of Dentistry were received with acclaim. The Hon. Dr. Vivian spoke briefly and the Chancellor of the University of Toronto, the Hon. Dr. Cody, was at his best in what he described as his "swan song". President Sidney Smith of the University also spoke briefly.

The inaugural address of the President Dr. William Boyd, Professor of Pathology in the University was entitled "The education of a doctor". It may be read in the November *Bulletin* of the Academy. A summary could not do it justice so is not attempted. When the ideas it suggested are adopted in schools of medicine students will be better taught and have vastly more enjoyment in their learning.

University Notes

University of Manitoba

The sixty-second class in the history of the University of Manitoba, Faculty of Medicine, received the M.D. degree at a special convocation in the civic auditorium on October 23. It was the first convocation of the university for the new president, Dr. A. W. Trueman. All the students who graduated that evening were trained in the accelerated course established during the war, and the president spoke of the strain to which both the staff and students had been subjected in accomplishing so concentrated a course. Dr. W. Fulton Gillespie, professor of surgery at the University of Alberta, addressed the new graduates. His advice to them was to grow as the art and science of their profession grew and to keep golden their aspirations.

Medals and prizes were presented by President Trueman as vice-chancellor. University gold medal for highest standing in fourth year in medicine — John Angus Boyd. Manitoba Medical Association gold medal for highest standing in the first four years in medicine—William Karlinsky. Charlotte W. Ross gold medal in obstetrics—John Angus Boyd. Dr. H. H. Chown prize in medicine—Myron Sanford Feinstein. Dr. H. H. Chown prize in surgery—Ashley Edwin Thomson.

The conferring of the degree of doctor of medicine was made by Hon. A. K. Dysart, chancellor of the university. Forty-three men and seven women were presented by Dr. A. T. Mathers, dean of the faculty of medicine.

ROSS MITCHELL

Miscellany

A Labour Leader's View of Health Insurance

[*The following extracts are taken from an address by Samuel Gompers, former president of the American Federation of Labour, on December 5, 1916. The complete address appears in the Bulletin of the U.S. Bureau of Statistics, No. 212, p. 845.*—EDITOR.]

". . . There has never yet come down from any government, any substantial improvement in the conditions of the masses of the people, unless it found its own initiative in the mind, the heart and the courage of the people. Take from the people of our country the source of initiative and the opportunity to aspire and to struggle in order that that aspiration may become a reality, and, though you couch your action in any sympathetic terms, it will fail of its purpose and be the undoing of the vital forces that go to make up a virile people. Look over all the world where you will and see those governments where the features of compulsory benevolence have been established, and you will find the initiative taken from the hearts of the people.

"There are certain species of compulsory social insurance that by their mere statement carry with them the conviction of their self-evident necessity and justice, into which the element of depriving the people of rights cannot enter—such as workmen's compensation and old age pensions. But when compulsory health insurance and compulsory unemployment insurance are proposed, the question arises at once, What are the conditions and regulations to be imposed by the government to regulate the conduct of the supposed beneficiaries?

"By reason of the many duties devolving on me I have not had the opportunity to prepare a paper. I have made some memoranda, and I ask your indulgence to present thoughts which press upon me in the best way I can within the limit of time set for these proceedings.

"The highest standards in the lives of the workers have been secured by the development, the organization and the exercise of the economic power of the workers. Although this econonic power is superficially indirect, it is in reality the most potent and the most direct social insurance of the workers. It is the only agency that can readily guarantee to the workers protection against the results of the eventualities of life and give them a feeling of security.

". . . The organizations of labour provide social insurance in cases of sickness or unemployment far too little to be true to their mission, far too narrow to suit my impatient spirit; but the willingness to fly from the ills we bear to those of which we know not is quite too general among men who are well meaning, yet who are theorists, or who desire to indulge themselves in a fad that involves grave consequences not only to the workers themselves but to the fundamental principles of freedom.

"Social insurance cannot even undertake to remove or prevent poverty. It is not fundamental and does not get at the causes of social injustice. The only agency that does get at the cause of poverty is the organized labour movement.

"Social insurance, in its various phases of sickness insurance, unemployment insurance and death benefits, provides the means for tiding over an emergency.

"The labour movement aims at constructive results—higher wages, which mean better living for the worker and those dependent upon him, better homes, better clothes, better food; and shorter hours of work, which means relief from overfatigue and time for recuperation, workers with better physical development and with sustained producing power. Better physical development is in itself an insurance against illness and a certain degree of unemployment. The short hour workmen, with higher wages, become better citizens, better able to take care of themselves.

"Then again, the first step in establishing compulsory social insurance is to divide people into groups, those eligible for benefits and those considered capable of caring for themselves. The division is based on earning capacity. This governmental regulation must tend to fix the citizens of the country into classes, and a long-established insurance system would tend to make those classes rigid.

"Governmental power grows upon that on which it feeds. Give an agency power, and it at once tries to reach out after more. Its effectiveness depends on increasing power. This has been demonstrated by the experience of the railroad workers in the recent enactment of the Adamson law. When Congress exercised the right to establish eight hours for railroad men, it also considered a complete program for regulating railroad workers, which culminated in the effort to take from them the right to quit

work, and conscription providing for compulsory service.

"Recently a gentleman of the highest standing stated to me that during the time he was in Germany, and in a position to know, German workmen came to him seeking aid to get out of that country to the United States. They told him that by reason of the taxes which they were compelled to pay into compulsory social insurance schemes, they had no money left except for absolute necessities of life and were unable to secure sufficient funds to come to the United States even in the steerage. He said to me further that in Germany, where compulsory social insurance has been more extensively worked out than in any other country, the workmen of that country, by reason of their property interests in compulsory social insurance, have been compelled to remain in Germany and work under circumstances, wages, hours and conditions of employment which forced them to endure conditions below standards of a living wage.

"Is it not discernible that the payments required of workmen for this compulsory social insurance interfere very materially with mobility of labour and constitute a very effectual barrier to the workers' determining their whole lives?

"It seems to me that what we in America will have to do is to proceed on grounds that shall bring not only social insurance of a practically advantageous character but that shall help to develop individuality and personality and character and help to recognize the real struggle of the masses of the people, to encourage them in their struggle so that they may have the higher and the better opportunity for self development. What we should aim to do is to encourage voluntary associated effort of free individuals for their social insurance.

"Industrial freedom exists only when and where wage earners have complete control over their labour power. To delegate control over their labour power to an outside agency takes away from the economic power of those wage earners and creates another agency for power. Whoever has control of this new agency acquires some degree of control over that agency to employees. It may also be controlled by employers. In other words, giving the government control over industrial relations creates a fulcrum which means great power for an unknown user.

"The introduction of compulsory social insurance in cases of sickness, or compulsory social insurance in cases of unemploymen means that the workers must be subject to examinations, investigations, regulations and limitations. Their activities must be regulated in accordance with the standards set by governmental agencies. To that we shall not stand idly by and give our assent.

". . . Men and women, I trust I may not be sounding my warnings on the empty air. I hope that they may find a lodgment in the minds and hearts of my countrymen. I bid you have a care in all these attempts to regulate the personal relations and the normal personal activities of the citizenship of our country ere it be too late.

"There is in the minds of many an absence of understanding of the fundamental essentials of freedom. They talk freedom and yet would have bound upon their wrists the gyves that would tie them to everlasting bondage. And no matter how sympathetic or humanitarian is the gloss over the plan and the scheme, I again bid you beware."

Canadian Medical War Services

MEDICAL OFFICERS APPOINTED TO THE R.C.A.M.C. — ACTIVE FORCE

OCTOBER, 1945

(Previous sections in January, March, April, May, June, July, September, October and November, 1945.)

SECTION LIX

Name	Address	Date of Appointment
Akin, F. L.,	Windsor, N.S.	6-9-45
Baragar, M. L.,	Winnipeg	16-8-45
Barclay, M. J.,	Trochu, Alta.	13-9-45
Bogert, J. R.,	Montreal	5-12-45
Brisebois, R.,	L'Epiphanie, Que.	1-9-45
Christianson, R. A.,	Canadian Army Overseas	5-2-45
Cole, P. A.,	Chester, N.S.	6-9-45
Creighton, A. M.,	Tatamagouche, N.S.	6-9-45
D'Intino, C. A.,	Sydney, N.S.	6-9-45
Fitch, R. H.,	Moncton, N.B.	6-9-45
Green, S.,	Halifax	6-9-45
Henderson, C. U.,	St. John's, Nfld.	6-9-45
Horan, P. J.,	St. John's, Nfld.	6-9-45
Kinley, G. J.,	Halifax	6-9-45
Locke, H. A.,	Liverpool, N.S.	6-9-45
MacDonald, M. S.,	Halifax	6-9-45
MacDonald, J. A.,	New Waterford, N.S.	6-9-45
MacDonald, J. P.,	Sydney, N.S.	6-9-45
McDonald, W. J.,	Calgary	13-9-45
MacIntosh, C. N.,	Dartmouth, N.S.	6-9-45
MacKinnon, K. J. C.,	Antigonish, N.S.	6-9-45
McNeil, J. O.,	Glace Bay, N.S.	6-9-45
Miller, G. E.,	Edmonton	13-9-45
Morin, R.,	Gravelbourg, Sask.	27-7-45
Morse, W. I.,	Paradise, N.S.	6-9-45
O'Donnell, W. J.,	Bathurst, N.B.	6-9-45
Oxorn, H.,	Montreal	6-9-45
Ripstein, R. B.,	Montreal	16-8-45
Roby, H. R.,	Truro, N.S.	6-9-45
Rochon, M. J. C.,	Montreal	1-9-45
Rosenfeld, G. B.,	Brooklyn, N.Y.	1-9-45
Stewart, H. P.,	Charlottetown	6-9-45
Wilkinson, A. A.,	Clarkes Beach, Nfld.	6-9-45
Younger, L. I.,	Edmonton	13-9-45

MEDICAL OFFICERS STRUCK OFF STRENGTH OF THE R.C.A.M.C.—ACTIVE FORCE

OCTOBER, 1945

SECTION LX

Name *Address*	*Date struck off strength*
Adamson, J. D., Winnipeg	18-9-45
Alexander, L. G., Calgary	11-10-45
Allan, B. M. E., Toronto	4-10-45
Allison, J. C., Belleville, Ont.	9-10-45
Anderson, B. F., Toronto	25-8-45
Argue, A. F., Montreal	7-9-45
Armstrong, E. C., London, Ont.	20-9-45
Bastedo, G. M., London, Ont.	19-9-45
Belanger, P. A., Ottawa	31-8-45
Bell, J. K., Sarnia, Ont.	11-9-45
Belkin, A., Eastend, Sask.	8-9-45
Belyea, C. C., Kitchener, Ont.	26-6-45
Bigelow, G. B., Victoria	16-9-45
Bonnell, F. H., Vancouver	20-8-45
Bowman, F. B., Hamilton, Ont.	28-9-45
Bradshaw, J. A., Hamilton, Ont.	5-10-45
Brown, M. H., Toronto	6-10-45
Brunton, J. F., Hamilton, Ont.	2-8-45
Bruser. M., Edmonton	29-8-45
Bucove, B., Rockglen, Sask.	3-10-45
Caldwell, A. L., Saskatoon	30-10-45
Carr, L. A., Hamilton, Ont.	24-8-45
Covernton, C. C., Vancouver	7-9-45
Dancey, T. E., Montreal	20-9-45
Dickson, R. C., Toronto	13-9-45
Doan, H. I., Harrietsville, Ont.	7-9-45
Drake, C. G., Windsor, Ont.	27-7-45
Fahrni, B. M., Winnipeg	29-8-45
Fairbairn, L. M., Estevan, Sask.	22-8-45
Gaboury, P. C., Outremont, Que.	30-9-45
Ganshorn, J. A., Vancouver	21-9-45
Gibbons, R. J., Ottawa	31-8-45
Gibson, T. C., Hamilton, Ont.	5-9-45
Gosselin, J., Quebec, Que.	6-9-45
Gough, W. F., Drummondville, Que.	21-9-45
Greenwood, W. F., Toronto	28-8-45
Hair, H. C., Toronto	21-9-45
Hall, W. M., Edmonton	9-8-45
Hankin, M., Thorsby, Alta.	11-10-45
Hart, R. G., Calgary	21-9-45
Hawke, W. A., Toronto	8-9-45
Homer, G. F., Vancouver	6-9-45
Howard, R. P., Montreal	4-9-45
Hough, H. B., Windsor, Ont.	11-10-45
Jennings, F. C., Saint John, N.B.	3-10-45
Jones, C. M., Halifax	30-8-45
Keddy, G. W. A., Saint John, N.B.	18-8-45
Kerr, R. B., Toronto	1-9-45
Kickham, L. A., Westlock, Alta.	25-9-45
Kindrachuk, W. H., Cudworth, Sask.	12-9-45
Kinsman, J. D., Dome Mines, South Porcupine, Ont.	9-8-45
Kirk, C. J., Saskatoon, Sask.	29-8-45
Kussner, J., Kirkland Lake, Ont.	13-9-45
Leroux, J. A., Vancouver	21-9-45
Lunney, T. E., Saint John, N.B.	22-8-45
Malone, G. M.	5-10-45
McCannel, J. S., Victoria	6-10-45
McCarroll, J. G., Port Arthur, Ont.	11-9-45
McCullough, D. W., Toronto	6-10-45
McCutcheon, J. E., Regina	13-9-45
MacDonald, D. G. H., Toronto	4-10-45
MacKay, A. F., Oshawa, Ont.	14-9-45
McKercher, A. E., London, Ont.	14-9-45
MacLeod, B. A., Fort William, Ont.	10-9-45
McManus, J. F. A , Garden Island, Ont.	5-9-45
MacRae, H. M., Toronto	27-9-45
Mellor, M. D., Westmount, Que.	3-10-45
Menzies, F. H., Leaside, Ont.	25-9-45
Middleton, W. W., London, Ont.	24-9-45
Minnes, A. G., Niagara Falls, Ont.	13-9-45
Minshull, F. A., Halifax	20-9-45
Murphy, G. H., Halifax	21-9-45
Murray, R. G. E., Montreal	27-9-45
Mutrie, R. R., Guelph, Ont.	21-9-45
Noonan, W. T., Toronto	20-9-45
Norman, H. R. C., Toronto	28-8-45
O'Brien, H. D., Halifax	7-9-45
Oille, W. A., Toronto	21-8-45
Orchard, C. B., Tisdale, Sask.	22-9-45
Palmer, W. M. R., Regina	26-8-45
Parlee, S. S., Edmonton	5-10-45
Patterson, J. A., Toronto	11-9-45
Peco, H. C., Wallaceburg, Ont.	12-9-45
Playfair, C. H., C.B.E., Hamilton, Ont.	1-9-45
Poyntz, L. K., Toronto	8-9-45
Ramsay, F. G., Turtleford, Sask.	4-10-45
Rathbone, E. D., Fort William, Ont.	1-10-45
Revell, D. G., Winnipeg	12-9-45
Richardson, J. C., Toronto	7-9-45
Richardson, R. W., Winnipeg	12-9-45
Robertson, C. T., Toronto	18-9-45
Roger, J. P., Quebec, Que.	1-10-45
Rother, I., Toronto	17-9-45
Rowed, R. B., Vancouver	28-9-45
Roxbough, D. B., Victoria	21-9-45
Schiffer, I., Toronto	19-9-45
Schroeder, F. W., Regina	22-8-45
Scott-Moncrieff, R., Victoria	31-8-45
Shane, S. J., Yarmouth, N.S.	23-8-45
Shaw, A. G., Toronto	7-9-45
Shaw, J. H., Charlottetown	6-9-45
Smith, F. H., Winnipeg	18-9-45
Spence, P. M., Fort William, Ont.	12-9-45
Spooner, H. J., Regina	24-9-45
Sturdy, J. H., Revelstoke, B.C.	11-9-45
Sutherland, D. R., Halifax	29-9-45
Tanzman, J., Saint John, N.B.	28-9-45
Templeton, D. W., Kingston, Ont.	27-9-45
Terry, K., Nelson, B.C.	8-8-45
Tucker, F. R., Winnipeg	31-8-45
Vallee. A., Quebec, Que.	29-9-45
Van Nostrand, F. H., Gormley, Ont.	28-9-45
Wallace, W. M., Massey, Ont.	12-10-45
Walters, C. H. A., Belleville, Ont.	28-8-45
Walters, J. A., Toronto	20-9-45
Wannop, G. G., Wetaskiwin, Alta.	13-9-45
Warcup, L. W., Vancouver	9-9-45
Weinlos, M., Edmonton	7-9-45
Wiglesworth, F. W., Montreal	31-8-45
Wrong, N. M., Toronto	26-9-45
Wyatt, J. P., Toronto	21-9-45

Correspondence

Procaine and Intramuscular Injections

To the Editor:

In accordance with present methods, I have been giving penicillin intramuscularly, or have been injecting it directly into furuncles and other localized infections such as felons, in combination with procaine hydrochloride. The great relief from pain has been very gratifying to both patient and doctor.

Three months ago it occurred to me that procaine might be used in conjunction with other intramuscular injections, such as liver extract and vitamin B complex. These two preparations in particular are quite painful on injection in the orthodox manner. Using ½ c.c. of 2% procaine with 1 c.c. of medication, and injecting slowly, the amount of pain has been minimal. Injections are given in the deltoid and outer aspect of the thigh. My patients have been most grateful for the relief from the usual pain and discomfort they suffered. I have not been able to detect any harmful effect on the potency of the medication.

A. A. BASSETT.

Little Current, Ont.,
October 25, 1945.

The Specialist's Fee

To the Editor:

It would appear that the time has come for the C.M.A. to establish a tariff schedule. In doing so it will encounter the old problem of specialist's fees versus general practitioner's fees, and bring forth again all the dissatisfactions and antagonisms that this question always does. Indeed such feeling between the various branches of our profession will be stronger than ever, for we are entering an era where fees will be paid out of a common fund of limited amount, and it is every man's concern not only that his own fee be high enough, but that his confrère's be not unduly high, for obviously if his confrère receives more, he automatically will receive less. This feature renders imperative the establishment of what I have spoken of as a correlated tariff or as Dr. Strong later advanced as a tariff based on units of service. In such a tariff the question of specialist's fees as such adds an almost insurmountable difficulty in producing a schedule that is even reasonably satisfactory to the profession as a whole.

The concept that for given procedures a specialist's fee should be higher than the general schedule, though traditional, is logically untenable. After all, what are fees? We've thought all along of a fee as something a doctor charges, and hence a specialist should be entitled to charge more. But such a concept is superficial. Fees are not something somebody charges; fees are something somebody *pays* for something. Then if it is something that is paid for something, to suggest that one should pay for the *same* procedure a *different* fee, depending on whether the operator confines his practice to one branch of the art or not, is palpable nonsense. "But", it is replied, "the specialist does it better". If that be true (and the statement is not nearly 100% correct, for there is a wider difference in the capabilities of individual general practitioners than there is between some general practitioners and some specialists) then to sanction two schedules for the same procedure is to say in effect, "You can have a good job or a poor one; the profession in Canada sponsors both". Surely we do not want to be placed in that position.

Is it not better to adopt the principle that "a workman is worthy of his hire" and "a piece of work well done, is worth what it is worth, regardless of the specialty to which the worker belongs?" Then if that be true, from a *fee point of view* there need be no division into specialties. There would be but one long schedule including *all* procedures, each set down and the fee correlated with all the others. Remembering a fee is something someone pays for something, a good procedure in each instance can be fairly tagged. Such a complete listing would not of course in any way imply that one not trained in any procedure so listed would be expected to carry it out. Contrariwise the issuance of a general practitioner's schedule and a specialist's schedule would tacitly imply that any general practitioner was expected to perform, and would be paid for, any operation on that list.

"There is perhaps grave need for limiting the work any given man may attempt, but it is submitted that manipulations of the tariff do not accomplish such purpose, nor is it the responsibility of the Tariff committee to solve such problems."* One could eliminate the "perhaps" from the above; the rest of the quotation is unquestionably true.

The need is grave and the responsibility is the profession's own. How is this to be met? "Rome was not built in a day" nor will our house be put in order over night by any regulation. We can not say to this man or that, "Though you've been doing such and such for twenty years (or ten or five) you cannot continue now so to do". But men of vision can see beyond the immediate and can say, "From this point on, no one can *start* doing any procedure until he has qualified himself to do a good job", not limit his work necessarily, but to actually qualify himself in that procedure (after all this limitation business has perhaps been carried to extreme). Then steps might well be taken to see that he keeps qualified. Were this done, one could confidently anticipate the time when the problem set out in the previous paragraph would be solved to the satisfaction of everyone and a great forward step in medical service taken.

In the meantime no financial barrier would be placed in the way of any individual, group, or government agency, getting service from one well qualified to give that particular service. One of the most knotty problems in prepaid medical care would be solved and one of the greatest causes of friction and contention within our profession would be eliminated. A united profession would be ready to meet the many other problems that the future is hurling down upon us.

C. C. WHITE.

November 10, 1945,
Chatham, Ont.

* From the Preamble O.M.A. Tariff Schedule, 1942.

Dr. J. W. Shackleton of the E. I. DuPont Company announced recently that nylon is being used as an insulating coating on wires. It is extruded on to the wire in a coating seven thousandths of an inch thick at the rate of 1,000 feet a minute.

Extracts from Correspondence in other Journals

[*It is well recognized that from whatever cause it may be, we in Canada do not frequently express ourselves in letters to journals or newspapers. Certainly the writing of letters of this kind is far more common in Great Britain than on this side of the Atlantic. There is a value in it which cannot be denied. It is not only that through this medium free discussion can be carried on and often public opinion is built up, but some subjects do not lend themselves to the formal treatment of an article and yet may be both interesting and important. However, since this national disinclination for letter writing does exist we may compromise by extracting from time to time some of the correspondence from British medical journals to show not only what topics are being discussed but also how they are dealt with. The selection will be arbitrary to the extent of the interest of the subject and the attractiveness of the contributions on it. Some subjects are perennial, others of course are of passing interest only.*—EDITOR.]

Demobilization and Bitterness

Many letters have appeared on the hardships of slow demobilization of medical officers. The following, by Major H. B. Stallard, R.A.M.C. (T.A.) (*Brit. M. J.*, p. 407, Sept. 22, 1945) is well worth reproduction:

"In the medical press of late there have been letters from Service doctors which savour of the bitterness many of them feel about their present circumstances and their future. In the Army there are some reasons for this, particularly between those who volunteered (T.A., S.R., and others) and those conscripted, and also towards young civilians who have served in the E.M.S. and private practice. Perhaps the lot of young doctors who volunteered and have spent all the war as battalion and field ambulance officers while their contemporaries stayed as civilians to gain some higher qualification and later entered the Army as specialists in a higher rank is worse than those of us who in middle age have lost our well-established practices. Let us hope that remedies will be found so that these grievous feelings may not be carried forward to spoil the team-work needed from our profession in the difficult play that lies ahead of us, for bitterness is bad and a hindrance.

"Most of us who have been in the Services have gained much that outweighs material loss and even professional advancement. We have met some really fine men we would not have come across otherwise. Our consciences are quiet on the matter of what we thought was our duty. Many of us have been privileged to feel in times of military success and adversity that we were a small part of the national team on the field. Our casualties compared with the combatants have been relatively small in killed and wounded, and we have indeed to be thankful that the sea or six feet of African sand or European earth has not been the lot of most of us. Despite all the irritations and frustrations that I in common with most medical officers have felt during service, I know that I owe much to the Army. I may be accused of being more fortunate than the majority, for in 5 years and 11 months of service (mostly overseas) I have had 2 years and 11 months' first-class surgical work with excellent equipment. During the remaining 3 years such clinical work as I had to do touched rock-bottom with meagre equipment and under conditions that were unnecessarily squalorly. For 15 months my duties were concerned with P.T., games, and those of a company officer. However, even the doldrums of transit camps and troopships can be put to good use in writing papers, or even books, and in reading (congested humanity permitting).

"Let us hope that those in charge of hospital and other appointments will do their utmost to sweeten the bitterness by giving a good chance, particularly, to the released M.O. whose patriotism and altruism led him to volunteer for the Services before he had taken the higher qualifications he had planned in peacetime. Also that public authorities may be sympathetic and find appropriate accommodation where the 'released' doctor may live and practise.

"On release from the Service it is, I think, considerably harder to resist bad feeling when unable to find accommodation in which to live and practise."

This brought out two more on the same subject. Dr. J. M. G. Wilson writes (*Brit. M. J.*, p. 477, Oct. 6, 1945):

"Major H. B. Stallard's letter comes like the calm voice of reason amid the cacophonous sounds of a family squabble. Those who, like myself, saw the war coming, joined the Territorial Army or the equivalent, and served throughout all or most of the time in field units, have no wish to fling away in bitterness what they have gained by seeing where their duty lay and doing it.

"Maybe we have lost professionally; maybe we can never hope to compete with our brethren who stayed on at hospital and rose through higher degrees to junior honorary posts. But a man cannot have everything in life; and where we have lost on the one count, perhaps we have gained something in the sphere of less ponderable qualities. Certainly, speaking for myself, I feel I have gained something which I find it hard to define; perhaps it is most closely related to what I have seen of self-sacrifice and the 'muching-in' of the ordinary soldier for the common good.

"I shall always remember the words of a friend, written to me shortly before he was killed, in answer to a rather carping letter of mine: 'Don't let's spoil the first fine careless rapture of having been in from the beginning by calculating now whether it was worth the cost or not.' A man is a certain kind of person, who does certain kinds of things. Bitterness that those things do not always bring in the kind of return we should like will get us nowhere."

and from Squadron Leader Brown, R.A.F. (in the same issue):

"For a long time now your correspondence columns have carried letters complaining of the utter wastage of medical man-power in the Services, the hardships and gross overwork of general practitioners, and the relatively fortunate position of the young specialists in E.M.S. hospitals. These are facts, and bickerings among ourselves will not alter them. Our only hope is in closer unity, preferably through the B.M.A., whose greatly increased membership during the war shows that most of us do want some central medical body to which we can give loyalty in exchange for the strongest possible presentation of our cause, anywhere and always.

"Major Stallard was fortunate in spending nearly half his service in hospital. For seventy-three barren months this had eluded me and many of my colleagues. The time wasted on so-called sanitation, administration, and stores accounting is a dead loss and must be written off as an offering to the war effort; perhaps it might rank as honourably as a minor wound. At least these things were done, and it is better that they should be done by a doctor than left undone.

"The folly of wasting doctors on such work is not ours. Stallard's experience in meeting fine men has been mine also. A medical officer meets high and low alike, and I

have had the privilege of serving with some of the finest men and women imaginable. High among these I would place my own colleagues. They also were usually on uncongenial work, but, as a rule, they have done that work well, and shown professional skill, friendliness, and ethical conduct, which made the fact of our meeting transcend the circumstances. These doctors have been Naval, Army, and Air Force, British civilians, and medical officers of the American, Canadian, Australian, South African, and Polish Forces. Many times have we exchanged grumbles about our several lots, but we have worked and played together in harmony.

"I suggest that as each is released he should become an active member of his local Division of the B.M.A., and make known to his representative just what he thinks can be done to make Service medicine attractive. If this were done, your committees would receive all the constructive ideas bred of our individual search for better things; and a strengthened Association could put before the Government a scheme for a medical service so good that the competition would be to get into it, not out of it."

Pasteurization

Pasteurization of milk is one of the more permanent items. Dr. A. P. Ford, (*Brit. M. J.*, p. 301, Sept. 1, 1945) fully supports the editorial stand urging pasteurization of milk, and concludes:

"The medical profession has a grave responsibility in this matter. Until we so rouse public opinion that Parliament has no option but to pass the necessary legislation we must ourselves accept some share of the responsibility for our 2,000 deaths per annum as the result of bovine tuberculosis. We have the opportunity of stimulating public opinion by impressing upon all our patients the danger of drinking milk which has not been either pasteurized or boiled, and I would suggest that every doctor, whether in private practice or holding a public appointment, should do all he can in this respect."

He is followed however, in the same issue by Dr. G. A. Stephens who thinks that the fundamental problem at issue is the vitality of the cattle; if this is low tuberculosis develops more readily; improvement can be brought about by improving feeding conditions by adding lime to the land. He goes on to say:

"You write of pasteurized milk as if it were all of the same quality, notwithstanding your reference to the American Army regulation that soldiers must have only pasteurized milk from tuberculin-tested cows. It is well for all your readers to realize fully that pasteurization of milk from Tb cows cannot possibly make that milk A1 milk even on the first day, while the rapid deterioration of milk which has been pasteurized makes it on the second day of no value at all."

To which the editor replies:

"We do not know what an A1 milk is, but we do know that milk containing tubercle bacilli is rendered safe by pasteurization—witness Price's observations at Toronto. The deterioration in keeping quality of pasteurized milk on the second day is, of course, less than in the same milk untreated; every dairyman knows this. And if by 'no value at all' the writer means nutritive value then the statement is simply untrue."

Two weeks later, Dr. H. Tudor Edmunds adds his comment (Sept. 11, p. 367):

"It would seem from a perusal of the recent correspondence on this subject that most members of our profession still regard good health as being due to the absence of pathogenic bacteria, and all the evidence, both recent and remote, that good health is due to a way of life is ignored. That vigorous health can usually be obtained by following certain simple natural laws is forgotten by all but a notable few. Such things as cleanliness, or the quality of the animals we eat or which provide us with milk, are matters that only cranks bother about. And so we have the present situation in which the general public is told that, although part of its diet consists of sewage, it does not matter in the least so long as that sewage is pasteurized!

"In fact, as the guardians of the people's health, we are now advocating the spending of millions of pounds on apparatus for this purpose of sterilization. 'Then,' we say in effect, 'you may eat any filth you like, whether the produce of a cesspool or the fluids which have come from the disease-ridden body of a tuberculous cow, and provided you pasteurize it first it will keep you in health and supply you with the food you need! The fact that it is brimful of waste and toxic materials and contains billions of dead disease germs does not really matter, for it has been put through a special magical process that turns the foulest refuse into excellent food, and in these days of shortage what could be more commendable?'

"Since the conditions of milk production in this country are so deplorable it will no doubt be necessary, *as a purely emergency measure*, to institute widespread pasteurization. But in so doing let us make it abundantly clear, with the utmost publicity, that such pasteurization is a temporary procedure, until such time as we improve the quality of our milk production and remove the ignorance of many of those who handle it. If the emphasis is put on pasteurization, as at present, we shall only succeed in further debasing our food supply, whereas a campaign aimed at the enforcement of scrupulous cleanliness and an insistence on giving our cattle the same care and hygienic treatment we give our racehorses would result in a healthy milk supply, free from disease and of high food value."

Dr. Esther Carling writes in the following week (p. 404, Sept. 22):

"The pros and cons of milk safety, purity, or cleanliness, are argued *ad nauseam*, till some readers must feel, 'Why drink milk at all whatever the adjective?' If pure milk means only an unadulterated product, clean milk only one free from dirt, and safe milk one in which living disease germs do not flourish, cannot the public have such elementary virtues without highfalutin and meaningless names like 'accredited' being attached to the article? As doctors must, more than ever before, be teachers in the brave new world, and as they do know more of tuberculosis, typhoid, etc., than other folk, it is well that Dr. Hawthorne should once again remind us that it is simple duty to our patients in every house we enter to assure ourselves that no one is being slowly and deliberately poisoned by the consumption of milk that is *unsafe*."

There are several other letters on pasteurization and there will almost certainly be many more in the future, but these will serve as samples for the present.

Under-pillow speaker, a flat miniature device to enable individual hospital patients to hear radio programs without disturbing others, contains a crystal drive-element and a plastic diaphragm. The case, hermetically sealed, may be dipped without injury in disinfecting solutions.—*Science News Letter*, August 18, 1945.

Abstracts from Current Literature

Medicine

A Comparison of the Behaviour of Microcrystalline Sulfadiazine with that of Ordinary Sulfadiazine in Man. Reinhold, J. G., Phillips, F. J. and Flippin, H. F.: *Am. J. M. Sc.*, **210:** 141, 1945.

Using patients in the medical wards of the Philadelphia General Hospital Reinhold and his associates compared the effect of the microcrystals of sulfadiazine with that of the ordinary macrocrystalline compound. Seventy-five patients suffering from pneumonia treated by means of the microcrystals showed no evidence of decreased therapeutic effectiveness or of increased toxicity. On the other hand there was evidence of a more rapid rise in concentrations of sulfadiazine in serum and more rapid excretion in the urine during the first hours due to an increased rate of absorption. This increased rate of absorption was considered to be due to the fact that the microcrystals remained in suspension in the stomach and consequently were discharged into the duodenum sooner than the ordinary preparation. In fasting subjects the rate of absorption was decreased but remained greater than for microcrystalline sulfadiazine. The microcrystals are of particular value where sulfadiazine must be administered in liquid form in that they remain in suspension for weeks or even longer. E. S. MILLS

Meningococcic Meningitis Treated with Sulfadiazine and Sulfamerazine. Sweet, L. K. *et al.*: *Ann. Int. Med.*, **23:** 338, 1945.

The authors have treated 207 patients with meningococcic meningitis during a three year period, using either sulfadiazine or sulfamerazine as the principal therapeutic agent. The gross mortality was 10.1%. There was no significant difference in the case fatality rate in patients treated with the two drugs. The number of patients treated, the case fatality rate, and the duration and severity of illness were less in 1944 than in 1943.

The etiological diagnosis was established immediately from direct examination of the cerebrospinal fluid in 188 (90.8%) of this group of 207 patients.

The factors of the greatest prognostic significance at the time of admission were the presence or absence of the coma-delirium state and the age of the patient. In patients who were delirious or in coma, the finding of numerous micro-organisms in or the virtual absence of dextrose from the initial specimen of cerebrospinal fluid added to the gravity of the prognosis.

There was no relationship between the concentration of the sulfonamide in the blood and the outcome in meningitis. Massive doses of these drugs are not necessary for most patients with meningococcic meningitis. Careful appraisal of patients and of the findings in the cerebrospinal fluid will indicate those who require more vigorous treatment. S. R. TOWNSEND

The Effect of Chemotherapy on the Duration of the Carrier State Following Scarlet Fever. Rubenstein, A. D. and Foley, G. E.: *New England J. Med.*, **233:** 315, 1945.

The large majority of cases of scarlet fever still harbour the causative organism in the upper respiratory passages after the usual three weeks' isolation period. This prolonged carrier state is of great importance in the spread of the disease. Following a careful study of two small outbreaks of scarlet fever it was found that the sulfonamides (sulfamerazine, sulfathiazole and sulfadiazine, the latter employed as a local spray as well as orally) had no effect in preventing the development of late secondary cases. Such drugs cause a period of "cultural latency" during which the organism cannot be obtained but it reappears at a later date.

In the opinion of the authors the sulfonamides are of therapeutic value in the treatment of scarlet fever and also in dealing with healthy carriers. These drugs are of no apparent practical value in dealing with the problem of the convalescent carrier. NORMAN S. SKINNER

The Diagnosis and Treatment of Cystitis in Women and Children. Kretschmer, H. L.: *New England J. Med.*, **233:** 339, 1945.

Cystitis is rarely a primary condition in the female of any age and when the triad of frequency, dysuria and pyuria occur it may be a secondary manifestation of any one of a great variety of pathological processes, systemic, neurological, gastro-intestinal, pelvic or renal. If the symptoms do not quickly and permanently disappear following institution of therapy thorough investigation is essential.

If a thorough history, physical examination (with particular attention to the genital tract) and examination of a catheter specimen of urine (with stained smear of the sediment and culture for tubercle bacilli and other organisms) does not result in explaining the symptoms an intravenous pyelogram and, if necessary, retrograde cystoscopy, should be carried out. The latter is to be avoided in the presence of renal tuberculosis.

Treatment depends upon the underlying cause. Symptomatic relief may be obtained with application of external heat and hot vaginal douches of weak bicarbonate solution. The bowels should be attended to but purging should be avoided. Tincture of hyoscyamus and potassium bromide by mouth or rectal suppositories of opium and belladonna are helpful, along with alkali and urinary antiseptics by mouth. NORMAN S. SKINNER

The Hazard of Transfusion Malaria after the War. Rubenstein, A. D., Shulman, M. H. and Merrill, D.: *New England J. Med.*, **233:** 234, 1945.

Malarial organisms may remain latent in the body for long periods of time, especially the quartan variety, and this presents a hazard in regard to the selection of donors for blood transfusions. All persons who have lived in regions where malaria is endemic, particularly the large group of returning veterans, should not be employed as donors.

Since 1929 there have been twelve cases of post-transfusion malaria reported in Massachusetts, 9 quartan, 2 tertian and one of undetermined type. It is known that the period of latency in tertian infections may last for about five years and it is probable that it may last very much longer in the case of quartan malaria. NORMAN S. SKINNER

Surgery

Resurfacing of Dorsum of the Hand Following Burns. Farmer, A. W. and Woolhouse, F. M.: *Ann. Surg.*, **122:** 39, 1945.

Resurfacing of burned hands is necessary for any one of the following lesions: (1) a surface covered with easily traumatized scar epithelium, or patches of scar epithelium with intervening areas of more or less normal skin; (2) a surface covered with "burn keloid"; (3) large granulating areas, or (4) large granulating areas with exposed tendons and open joints. Aims of resurfacing are restoration of function, provision of a resilient surface capable of withstanding ordinary trauma, and to improve appearance.

Flexion of the wrist, metacarpophalangeal and interphalangeal joints is due to scar contracture and structural joint changes. Loss of abduction of fingers and thumb is due mainly to interdigital webbing. Stiffness due to fixation does not develop in two or three weeks. Immobilization of the acute lesion is considered beneficial. Tendon and joint capsule destruction may cause extensive joint stiffness, occasionally bony ankylosis, unless resurfacing is done quickly, followed by tendon grafting. Free grafts, 0.016 to 0.020 inches thick, are used; rarely a pedicle graft.

If there is no open wound preoperative preparation is that of any clean operation. If a granulating surface is present it is dressed with a 1.10 solution of electrolytic hypochlorite for 3 or 4 days prior to operation. Protection of the skin edges is unnecessary during this period.

It is unnecessary to change to saline dressing on the last preoperative day. Frequency of dressings depends upon the amount of discharge and slough. Dressings should be kept moist. Patients with open wounds are given sulfathiazole for two days before, and three after, operation.

The operation is done under general anæsthesia. If both hands are involved two operating teams work simultaneously. Pneumatic tourniquets ensure bloodless fields. Granulating surfaces are cauterized with 60% silver nitrate. The resulting eschar plus the peripheral zone of scar epithelium is removed in one piece. In clean cases the scar epithelium is peeled off. Large bleeds are ligated with 000000 catgut.

Grafts, cut with the Padgett-Hood dermatome are fastened with a running suture. If two grafts have to be sewn together the junction is staggered to avoid a linear scar. Interdigital webbing is prevented by placing a maximum of tissue in the interdigital clefts and placing suture lines at right angles to the interdigital scar. Rarely are the grafts punctured.

Clean cases are dressed with saline gauze, others with strips of gauze soaked in liquid paraffin and 1.10 sodium hypochlorite. Fingers are individualized. Nothing is packed into the interdigital clefts. Wrist and finger joints are held in approximately full flexion while being dressed. The palm is filled with fluffed gauze. The entire hand is covered with two layers of pads; the inner layer wet. Hand, forearm and distal half of the arm, with the elbow flexed, are bandaged with bias-cut flannelette. A light plaster of Paris shell is applied over all. The tourniquet is then removed. The dressing is removed in 10 to 14 days. Active finger exercises are begun. Daily massage of the graft with lanolin or cocoa butter is commenced. In a very large series of cases treated in this manner only 3 had less than a 100% take. STUART GORDON

Obstetrics and Gynæcology

Peroneal Palsy as a Complication of Parturition. Mills, E.: *J. Obst. & Gyn. Brit. Emp.*, **52:** 278, 1945.

Seven cases of peroneal palsy are recorded, 3 from personal observation and 4 from hospital records. These cases bear out the points as follows: (*a*) The palsy follows difficult deliveries which entail extraction by the forceps. (*b*) The paralysis is unilateral. (*c*) It occurs on the side opposite to the one occupied by the greatest diameter of the fetal skull in the majority of cases. (*d*) The cause in the majority of cases must be instrumentation. In the minority direct pressure of the fetal head may be the cause, though in these, too, instrumentation cannot be excluded. (*e*) Pain and paræsthesia, though transient and not severe, precede the paralysis. (*f*) The paralysis affects the dorsiflexors and evertors of the ankle. (*g*) The paralysis will, in the majority of cases, clear up, and in those in which permanent damage is done the final paralysis is considerably less than the initial loss of function.

P. J. KEARNS

Vesicovaginal Fistula. Thompson, D. J.: *J. Obst. & Gyn. Brit. Emp.*, **52:** 271, 1945.

Ureterosigmoidostomy is useless if there is a rectovaginal fistula or a tear of the sphincter muscle of the anus. In these 42 patients 5 had one or other of these conditions. In one, both fistulæ were small and cured at operation. Another was cured of her rectovaginal fistula, but operation on the vesicovaginal fistula at the neck of the bladder failed. One patient had 2 large fistulæ, of which the rectal one was successfully repaired after performing colostomy. The vesical fistula was inoperable, and the patient was discharged at her own request to come back later for transplantation of the ureters and closure of the colostomy but she was not seen again. P. J. KEARNS

A Series of Forty Cases of Vesicovaginal Fistula. Thomas, G. B.: *J. Obst. & Gyn. Brit. Emp.*, **52:** 262, 1945.

Vesicovaginal fistulæ are classified, according to their situation, as juxta-cervical, midvaginal, or juxta-urethral. In the 40 cases there were 18 juxta-cervical, 5 midvaginal, and 17 juxta-urethral fistulæ. The results of their treatment are given, and it is shown that the juxta-cervical and midvaginal fistulæ were all operable by the flap-splitting method, and that all but one which were operated upon healed at the first attempt. By contrast the juxta-urethral fistulæ were less successful, only 8 being cured out of 14 cases which submitted to operation. A technique for the flap-splitting operation is described and illustrated, and other operations used and the after-treatment are also described. The view is advanced that the repair by the abdominal route is probably only rarely necessary. It was not required once in this series. It is suggested that transplantation of the ureters should rarely be required and should be avoided if possible. Classical Cæsarean section in suitable circumstances is advocated in cases of pregnancy following a successful repair. P. J. KEARNS

Basal Body Temperature Graphs as an Index to Ovulation. Thompkins, P.: *J. Obst. & Gyn. Brit. Emp.*, **52:** 241, 1945.

The shift in woman's basal body temperature level occurs at, or very near, the time of ovulation. In short, the "temperature-shift" in the basal temperature graph is often indicative of ovulation. (This is not the same as stating that ovulation causes the temperature-shift or that a temperature-shift necessarily accompanies ovulation.) If the temperature-shift is to be detected, reasonable care must be employed to ensure basal conditions when the temperature is taken. All temperatures for the accompanying graphs were taken per rectum by the patient in the morning before rising and before taking food or liquids. "Smooth" graphs depend almost entirely upon the attention given to maintaining basal conditions. Detailed instructions may be found in one of the publications cited. The graphs shown here were selected from records aggregating about 250 months' experience accumulated by some 60 private patients, all of whom recorded the data on special form sheets supplied by the author. P. J. KEARNS

Relation Between Gastric Acidity and the Anterior-pituitary-like Hormone Content of Urine in Pregnant Women. Way, S.: *Brit. M. J.*, **2:** 182, 1945.

Evidence is brought forward to show that in human pregnancy there appears to be some relation between the free and total acid in the gastric juice and the amounts of anterior-pituitary-like hormone secreted in the urine and that it seems to be inversely proportional. Further studies are being made. ROSS MITCHELL

The Effect on Infant Mortality of Vitamin K Administered During Labour. Potter, E. L.: *Am. J. Obst. & Gyn.*, **50:** 235, 1945.

In the majority of infants the prothrombin time is prolonged during the greater part of the first week of life. The administration of vitamin K to the mother prior to delivery or to the infant after birth will usually prevent the prolongation. After prolongation has once occurred administration of vitamin K will usually cause a return to normal. There is no proof, however, that prolongation of prothrombin time is a direct cause of hæmorrhage. The optimistic prophecies which were made early in the study of vitamin K in regard to prevention of hæmorrhage and reduction in mortality rates following routine administration of vitamin K do not seem to have materialized.

In the present study carried on for almost four years, 6,560 infants weighing over 1,000 grams were

born during the two years in which vitamin K was given and 6,630 were born during the next twenty-two months. The total fetal and infant mortality rate of 29.8 for the first two years is higher than that of 25.8 for the last two years in spite of the fact that no change of significance occurred. The mortality rates for live-born infants are identical in the two series, as are also the numbers of infants who showed evidence of hæmorrhage on postmortem examination.

The conclusion seems justified that no decrease in infant or fetal mortality can be expected to result from the routine administration of vitamin K to all women during labour. ROSS MITCHELL

Pædiatrics

Poliomyelitis and Recent Tonsillectomy. Anderson, J. A.: *J. Pæd.*, **27**: 1, 1945.

The relationship between poliomyelitis, especially the bulbar type, and recent tonsillectomy was investigated in connection with the 1943 epidemic in Utah. July, August, and September, during the ascending part of the curve of incidence, covered the period selected for study; 232 cases in children between the ages of 3 and 16 years occurred, of which 39 were of bulbar type; 4,199 tonsillectomies were done on children of this age group during the three months; 17 of these patients developed poliomyelitis within thirty days, all of bulbar or bulbospinal type. The mean interval between operation and onset was 15.9 days. The incidence of the disease was 2.6 times greater, and of the bulbar and bulbospinal type 16 times greater, in recently tonsillectomized children. R. CAMERON STEWART

Penicillin Treatment of Oral Inflammations in Childhood. Marks, M. B.: *J. Pæd.*, **26**: 6, 1945.

Thrush, Plaut-Vincent's infection, and herpetic stomatitis are the most common inflammations of the mouth in infants and children. The simpler cases can commonly be cured within a reasonable time with dyes, oxidizing reagents or antiseptics—1 or 2% gentian violet, boric and peroxide irrigations, glycerite of boroglycerin, or sodium perborate. More severe infections may be protracted in spite of treatment. Amelioration in such cases is rapidly brought about by the use of penicillin. Intramuscular administration is to be preferred. Four or five injections, within twelve to fifteen hours, are usually all that are required, with cure within a week. When this technique is considered undesirable, topical application in dilutions of 250 units per c.c. gives as good although seemingly somewhat slower results. R. CAMERON STEWART

Treatment of the Rat Bite Fevers with Penicillin. Wheeler, W. E.: *Am. J. Dis. Child.*, **69**: 4, 1945.

It has been noted by various writers that rat bite fever occurs in two forms. one caused by spirillum minus, the other by streptobacillus moniliformis. The symptoms and courses of the two diseases are similar, although some think that there are characteristic differentiating features. Spirillum minus may be isolated from the blood of patients by inoculation into guinea pigs and mice. Streptobacillus moniliformis may be cultured by special techniques.

Arsenicals have given good results in the treatment of spirillum minus infections, but dubious ones in dealing with the streptobacillary form. Sulfonamides are also ineffective. Gold salts have not led to dramatic response in human cases, although active in experimental mice.

Penicillin was found effective in induced spirillar cases in mice by Laurie and Collier, and in both types of infection in mice by Heilman and Herrell. Favourable results in human streptobacillus cases have been reported by Robins, Altemeier, and Kane. The author describes the results of penicillin treatment in four infants with rat bite fever seen in 1944. The streptobacillus was isolated from the blood of three, the spirillum from that of one. The babies ranged in age from five weeks to six months, and weighed from five to twelve pounds. The dosage of penicillin was 5,000 units intramuscularly, every 2 to 3 hours, for a week to ten days.

The three moniliformis cases, described in detail, all did well. Each had progressive anæmia. One had also an anæmia of sickle-cell type. Another required oxygen for respiratory distress attributable to a lesion of the larynx, and had also a small sternal abscess from which pus was aspirated. None showed local redness or swelling, and two had no noticeable rash. All were given sulfonamides, in addition to the penicillin, one for the upper respiratory condition, the others for possible pyogenic infection at the site of the bites.

The case associated with spirillum minus had a macular rash, and redness and swelling at the site of the bite. The author notes that this local inflammation should "suggest the possibility of infection due to spirillum minus. . . ." Mouse inoculation, as well as blood culture, is then indicated. Administration of penicillin was followed by dramatic recovery. This, so far as known, is the first human case of spirillum minus infection treated with penicillin to be reported.

An additional streptobacillary case, also treated with penicillin, is recorded in a subnote.

R. CAMERON STEWART

Hospital Morbidity and Mortality of Infantile Eczema. Epstein, S. and Luitgardis, M.: *J. Pæd.*, **26**: 6, 1945.

A series of one hundred hospitalized cases of infantile eczema is reported in adequate detail. The four clinical groupings of the disease as seen in infants are briefly described, and the causes of hospital morbidity and mortality discussed. There was an incidence of 23% of complications, but no deaths in the series. One patient was admitted three times, two others twice, each admission being counted as a new case. The ages ranged up to two years.

The infantile eczemas can be grouped clinically into three types of dermatitis—atopic, seborrhœic, and contact, and also an infectious form. Atopic dermatitis, the commonest variety in children, is an itching inflammation more or less acute, beginning early and involving the face practically always and frequently the body and extremities; 78 admissions in the series were of this category. Seborrhœic dermatitis is typically erythematous and scaly, without itching. "Cradle cap" belongs to this group. Atopic and seborrhœic forms may occur in combination. Contact dermatitis, or epidermitis, is usually of short duration in infants, asymmetrical, most commonly involving the legs and buttocks, relatively rarely the face. Infectious eczema chiefly occurs as intertrigo, eroded patches in the folds of the neck, axillæ and groins. Bacteria, and monilia and other yeastlike fungi, are apparently involved, with heat, moisture, and ensuing maceration contributing factors.

A high incidence of complications among hospitalized eczema infants has been noted, and this was confirmed by findings in the author's series: 64 cases were free from complications on admission; 15 later developed them; 36 patients presented complications on entry; 6 acquired additional ones. These 21 infants had 23 complications, a hospital morbidity of 23%. Nearly all were infections of the respiratory tract or gastrointestinal disturbances. All but one occurred among the 78 cases of atopic type.

Kaposi's varicelliform eruption, which occurred in three infants before admission, is an infection due to the virus of herpes simplex. A vaccinia-like eruption develops on a preceding dermatitis, accompanied by severe constitutional reactions.

Why do children with eczema develop complications? The author considers the diseased skin responsible for the secondary skin infections. Common in all groups before admission, later hospital incidence is negligible. Respiratory and gastrointestinal complications occur almost exclusively among atopic infants and are often acquired after hospitalization.

The atopic constitution, not the diseased skin, is here held to be the predisposing factor. These babies suffer from respiratory and gastrointestinal allergies, sometimes subclinical, and are therefore more susceptible to bacterial infection. Complications involving the two tracts occur at home as well as in hospital. Methods to lessen cross infection may be expected to reduce institutional incidence.

Cases of "sudden death from eczema" in infants undergoing local treatment have long been noted. While some were definitely due to infectious complications, others, even after autopsy, have remained unexplained. Reference is made to many of the theories advanced. The author suggests "a hypothesis of toxic effects from phenol-like tar products, in combination with interference with skin respiration and disturbance of the autonomous nervous system" as an explanation in some of the cases. The toxicity of coal tar is recalled and the suggestion made "that tar preparations should not be used over too great surfaces". R. CAMERON STEWART

Pathology

Diffuse Hepatic Necrosis Caused by Sulfadiazine. Herbut, P. A. and Scaricaciottoli, T. M.: *Arch. Path.*, **40**: 94, 1945.

The authors report two cases of diffuse liver necrosis in man caused by sulfadiazine therapy. They were able to find reports of four cases of acute diffuse hepatic necrosis caused by sulfanilamide in the literature, and, because of the apparent rarity of this lesion in sulfadiazine therapy, they consider their two cases to be of particular interest.

The first patient was a 32-year old negro woman who received the drug for a post-partum febrile state. A total of 9 gm. was given in the usual dosage. Nausea, vomiting, headache and epistaxis led to a cessation of the drug. Two blood cultures proved negative. Three days later jaundice was noted and the patient died after two more days. Autopsy disclosed a shrunken, soft, flabby, wrinkled liver, mottled yellow-brown, and spotted with hyperæmia and hæmorrhage. Microscopically, necrosis was extremely severe. The kidneys showed a severe nephrosis.

The second patient was a 45-year old white female who received about 12 gm. of sulfadiazine for pyelitis. This patient had also received the drug about one month previously. Two days later chills, fever and a generalized macular rash caused discontinuance of the drug. Jaundice appeared three days later and the patient died five days after she first became ill. Autopsy disclosed liver changes rather similar to the first case except that the organ was of almost normal size. The kidneys showed severe tubular degeneration and interstitial inflammation. There was no evidence of pyelitis.

The authors attribute the diffuse hepatic necrosis to inherent or acquired hypersensitivity of the liver for the drug. They consider the interstitial inflammatory lesion of the kidney to be due to an accompanying disease process, and not to the direct action of the drug on the renal parenchyma.

G. C. MCMILLAN

Sulfhydryl Protection of the Liver. Brunschwig, A., Nichols, S., Bigelow, R. R. and Miles, J.: *Arch. Path.*, **40**: 81, 1945.

In an attempt to elucidate the mechanism of the protective action of protein and methionine in chloroform injury to the liver, the authors studied the effect of three compounds containing utilizable sulfhydryl groups in dogs subjected to chloroform injury to the liver. These compounds were amigen, dl-methionine and sodium thioglycollate.

The method was as follows: 30 dogs were subjected to a standardized chloroform anæsthesia, and the resultant hepatic damage was determined daily for a period of 6 days by means of the bromsulphalein test. Having determined the individual animal's susceptibilities in this manner, the procedure was repeated in 2 months' time, using the compounds to be tested. It was found that amigen (casein digest) afforded irregular liver protection; that methionine and sodium thioglycollate gave about equal degrees of protection; and that two other compounds tested, which did not contain the sulfhydryl group, afforded no liver protection. These latter two compounds, disodium glutamate and sodium thiosulfate, were chosen so that a compound (disodium glutamate) closely resembling methionine but free from sulphur, and a sulphur containing compound (sodium thiosulfate) in which the sulfhydral group was absent, could be tested.

The data presented suggest that protein and methionine exert protective action against the hepatic injury of chloroform by virtue of their -SH components. G. C. MCMILLAN

Industrial Medicine

Therapeutic Use of Sodium Chloride in Industry. Stewart, D.: *Brit. J. Indust. Med.*, **2**: 102, 1945.

On heat producing processes and in hot weather, workers sweat excessively, the degree of sweating varying with the individual and with conditions at his place of work. A state of salt depletion due to the abnormal loss of sodium chloride through the skin, is the result. To counteract this and to prevent heat exhaustion, fluid replacement is necessary and should include a certain amount of sodium chloride. In its absence an individual will suffer from fatigue, cramp or collapse. The author of this article presents the clinical features of excessive heat as experienced in the three types of "heat disease". He then describes a preparation, which, after extensive trial, proved satisfactory. Many previous attempts to find one both palatable and physiologically correct, had not been successful.

The tablet prescribed contains 5 grains of sodium chloride, with other materials to improve palatability. One tablet dissolved in ½ pint of water makes a pleasant drink. One to three pints of this mixture per shift will entirely prevent the onset of unpleasant symptoms in the great majority of workers on hot processes.

The author stresses the basic importance of improving working conditions. Of equal value in the prevention of heat symptoms, are the physical fitness of the worker and the type of clothing he wears. Treatment for the various forms of "heat disease" is outlined briefly. MARGARET H. WILTON

Dermatitis from Wearing Apparel. Schwartz, L. and Peck, S. M.: *J. Am. M. Ass.*, **128**: 1209, 1945.

Dermatitis from wearing apparel is usually reported as isolated cases. The sale, however, of new materials containing substances of unknown toxicological properties, has resulted in occasional large outbreaks among the general population. Many articles of wearing apparel have been reported as causing trouble. The majority of the reported cases due to the wearing of fabrics have been caused by those fabrics to which some chemical has been added in their manufacture. In this article the author discusses different materials: silk, wool, glass, rubber and rubber-containing materials, leather, artificial leather, and furs, and explains the origin of the dermatitis caused by each.

Of particular importance are dyes and mordants, and fabric finishes. Finishes used in fabrics to give them a better feel and better wearing properties, to prevent runs and unraveling, to make fabrics noncreasing, and sometimes to hold the crease, to make them waterproof, flameproof, mothproof, and insect proof, are discussed with respect to their chemical composition, method of use and the possible hazard from their use.

The most practical method for demonstrating the actual cause of a contact dermatitis is the patch test.

This must be properly carried out and interpreted and the distinction between substances which are primary skin irritants and those called sensitizers must be recognized. The author discusses in general the technique of the diagnostic patch test when performed with liquids, with powders and with solids, and in particular, its use with fabrics, furs, leather, shoes, rubber and jewelry. He explains the provocative patch test, and the prophetic patch test and also the interpretation and reading. MARGARET H. WILTON

Radiology

Beneficial Effects of Roentgen Therapy in Advanced Cases of Rheumatoid Arthritis. Borak, J. and Taylor, H. K.: *Radiology,* **45:** 377, 1945.

During the past two years the authors have treated 66 patients with advanced rheumatoid arthritis, patients who failed to respond to the usually accepted methods of treatment such as gold therapy, vaccines, physiotherapy, surgery, etc. These patients were treated according to their pathological status as determined by clinical and roentgen examinations. The involvement was classified as stage one, two or three, and the amount of radiation delivered depended upon the stage of the disease process within any given area. Of this group they selected for critical study 10 patients with a total of 85 joint areas involved. Good results were obtained in most cases. Roentgen therapy is given for the relief of local symptoms, to alleviate pain, and increase mobility, and is employed only after failure of the usually accepted methods of treatment. R. C. BURR

Pantopaque Myelography. Arbuckle, R. K., Shelden, C. H. and Pudenz, R. H.: *Radiology,* **45:** 356, 1945.

Roentgenograms of the lumbosacral spine without the aid of myelography are of little definite value in the diagnosis of protruded intervertebral discs. In the author's experience, pantopaque has been found to be a satisfactory medium for myelography because of ample contrast, lack of irritating properties, low viscosity, and ease of removal. Despite the fluidity and low viscosity of the medium, which allows it to fill all irregularities of the dural sac, many protruded discs cannot be detected with our present technique. Pantopaque myelography should be carried out routinely as an aid in the diagnosis and localization of protruded discs and to rule out tumours of the cord, meninges, and cauda equina.

It is demonstrated graphically that a negative myelogram in a patient whose subarachnoid space measures less than 16 mm. does not preclude the presence of a protruded disc. R. C. BURR

Oto-Rhino-Laryngology

Some Lesions Associated with Fistula of the Frontal Sinus. Hickey, H. L.: *Ann. Oto-Laryngol.,* **54:** 143, 1945.

Only those lesions have been considered which produce external fistula by spontaneous perforations through the anterior wall or floor of the frontal sinus. The important factors are : (1) increase in intrasinus pressure incident to the closure of the nasofrontal duct by swelling or tissue mass; (2) pressure necrosis and perforation of bone.

The lesions causing a frontal sinus fistula may be tabulated as follows: acute or chronic frontal sinusitis and ethmoiditis; osteomyelitis of the frontal bone, tuberculous or syphilitic; granulomatous and necrotic processes; mucocele or pyocele; neoplasms such as chondroma, osteoma or malignant growths.

The author reports 3 cases. Case 1.—The left supraorbital swelling began about 2 weeks following removal of extensive nasal polypi. X-ray showed the outline of frontal sinuses to be indistinct and a bony defect near the upper border of the left frontal sinus. After external sinusotomy, tissue appearing malignant protruded through the opening and histological examination revealed squamous cell carcinoma. The left frontoethmoid exenteration and roentgen therapy led the patient to a period of four-year cure without any recurrence. Case 2.—About the same onset. A mucocele was found. Case 3.—Extensive chronic left frontal sinusitis treated by a modified Lothrop external sinusotomy. V. LATRAVERSE

Cilia and Penicillin. Proetz, A. W.: *Ann. Oto-laryngol.,* **54:** 94, 1945.

Strips of ciliated respiratory epithelium were subjected to the drug in various concentrations with the following results: periods for which the ciliary beat persisted during immersion were: 250 units per c.c.—25 hr. 50 min. to 27 hr. 45 min.; 500 units per c.c.—15 hr. 25 min. to 19 hr. 35 min.; 5,000 units per c.c.—3 hr. 20 min. to 6 hr. 25 min.

The solutions recommended for local application (250 units per c.c. isotonic NaCl sol.) had no appreciable adverse effect on respiratory ciliated epithelium. The ciliary beat ceased only when the epithelium disintegrated, which it did after some 27 hr. In solution of 5,000 units the beat was reduced approximately half-speed within a few minutes. While this concentration has not been recommended for topical application, it is useful to know that the stronger solutions are less well tolerated than the weaker ones.

The author concludes that solutions of penicillin (sodium salt) recommended for topical application have no damaging effect on the cilia or the epithelium of the respiratory mucosa over periods useful in clinical practice. Stronger solutions tend to impede ciliary action. V. LATRAVERSE

Dermatology

The Danger of Continued Arsenotherapy in Cases of Erythema of the Ninth Day. Leifer, W.: *Am. J. M. Sc.,* **210:** 458, 1945.

Despite the terminology which denotes a cutaneous eruption the author found that the only symptoms common to all of his series of 14 cases were fever (101 to 105°), headache and weakness. Cutaneous eruption occurred in only 3 cases (21.4%). The consensus regarding etiology is that it is due to a sensitization to arsenic. Administration of arsenicals (mapharsen in the series described) shortly after recovery from the initial reaction produced parenchymatous damage including hepatitis, agranulocytosis and nephritis.

Fever in the first 2 or 3 weeks of arsenotherapy may be of different origins. After the initial dose it is usually a part of the Herxheimer reaction, and does not recur after subsequent injections. After the later injections it is evidence of toxic reaction or intercurrent infection. It is safest to consider any such episode (except the Herxheimer reaction) in the first 3 weeks of arsenotherapy as due to sensitivity to arsenic. Arsenic should not be given again, if at all, until several months have elapsed. Penicillin did not evoke further reaction. In the absence of cutaneous eruption the reaction may easily pass unrecognized or misinterpreted and serious damage be done if the presence of the 3 common symptoms of fever, headache and weakness is not accepted as a warning to discontinue arsenic.

D. E. H. CLEVELAND

Skin Diabetes: Hyperglycoderma Without Hyperglycæmia. Urbach, E.: *J. Am. M. Ass.,* **129:** 438, 1945.

The author suggests the term "skin diabetes" to designate the syndrome of therapy-resistant, recurrent or chronic dermatosis, a high fasting skin sugar level with a normal blood sugar curve and pronounced improvement of the dermatosis and drop in the high skin sugar level on a low carbohydrate diet sometimes combined with insulin. It has been observed that strikingly good results in resistant cases of dermatitis, furunculosis and pruritus, especially in elderly obese patients with purplish red complexions, in spite of normal blood sugar levels, are often obtained by the institution of a diabetic regimen.

By an exceptionally accurate method of microchemical examination of sections of skin, weighing about 30 mgm., it is found that the average sugar level of normal skin is 58 mgm. per 100 gm. and rarely approaches 68 mgm. The average ratio between skin sugar and blood sugar is 61%. When the skin sugar level is found to be over 68 mgm. per 100 gm. (in several cases it was found to be over 80 mgm.) the skin sugar-blood sugar ratio was over 70%. This is pathological and there is said to be an independent glycohistechia. It is therefore evident that a person can have a normal blood sugar and more or less elevation of fasting skin sugar. Low carbohydrate diet, usually reinforced by insulin, in such patients having resistant skin eruptions, notably dermatitis, furunculosis and pruritus, resulted in clinical improvement paralleled by a return to a normal skin sugar. On resumption of ordinary diet the skin sugar level rose again and symptoms recurred. For a full assessment of the significance of such elevations a skin sugar curve is necessary.

The author concludes that in such cases with independent glycohistechia and apparently normal blood sugar regulation there is disturbance of the carbohydrate metabolism of the skin, related in some manner to a partial interference with the action of insulin involving only the skin. It is believed that the sugar in the skin is not brought there only by passive diffusion from the blood, but there is also an independent intermediary carbohydrate metabolism in the skin as an organ, and the term "skin diabetes" is therefore justified.

D. E. H. CLEVELAND

The Possible Inter-relation of Psoriasis and "S. Fæcalis". Swartz, J. H.: *New England J. Med.*, **233:** 296, 1945.

It is believed that psoriatic subjects may be born with a congenitally susceptible skin, which may become sensitized to the products of one or more organisms in the lower bowel. In a small group of psoriatic patients studied, barium enema showed a low redundant colon, and suggested that there was a stagnation and piling up of certain organisms in the lower bowel. The intradermal injection of an autogenous stool vaccine brought on an aggravation of the psoriasis and a psoriatic lesion at the site of injection. While the latter might be a Koebner phenomenon (susceptibility of traumatized areas to develop psoriatic lesions) this would not account for the exacerbation of pre-existing psoriasis.

By a process of elimination it was found that *S. fæcalis* was the only stool organism which produced such a reaction. While colon redundancy and stagnation of colonic contents may occur equally in negroes, bacteriological examination of stools in a group of 14 negroes in an army camp failed to disclose the presence of *S. fæcalis*. This observation coincides with the fact that psoriasis is rarely seen in negroes.

In a series of 15 cases intradermal injection of *S. fæcalis* autogenous vaccine sometimes resulted in improvement of the psoriasis, but if the dose was too large it was definitely made worse. Injections of sterile water, saline solution and typhoid vaccine failed to produce such reaction in a control case.

It was observed that when a subject with psoriasis was given varied amounts and various strains of the organism the reaction varied considerably. It was hence concluded that the most successful results were obtained from vaccine made of one of the less virulent strains, so that the patient could be desensitized without untoward reaction. This method of treatment is not advised until further studies have been made and the beneficial effects from proper doses have been evaluated.

D. E. H. CLEVELAND

Obituaries

Dr. Benjamin deFurlong Boyce died on September 25, at his residence on Bernard Avenue, Kelowna, B.C.

Dr. Boyce was born on a farm near Dartford, Ontario, on March 30, 1866. He received his primary school education in Norham, attended high school at Campbellford and studied at Albert College, Belleville. He entered McGill University in 1888 and graduated as M.D., C.M., in 1892. After acting as intern for a short period in Montreal hospitals, he came out west in the same year as company physician to the Strathyre Mining Co., then operating at Fairview, near Oliver.

In 1894, Dr. Boyce came to Kelowna, the townsite of which had been laid out only two years before, and established a medical practice, which he carried on for nearly fifty years, retiring some five years ago. The new town was then inhabited by a mere handful of people and grew very slowly in its early years.

For several years he was the only physician resident in the large and then sparsely peopled area south of Vernon to the International Boundary, and his work involved long and arduous journeys on horseback or by buggy on rough roads and mountain trails before the advent of motor cars, so that he became a well-known figure throughout the Central and Southern Okanagan.

Dr. Boyce's varied interests and activities were so widespread that it would be difficult to enumerate all of them. He was keenly interested in outdoor sports in his younger days, especially hunting and fishing, and he never lost his love of the land as a true son of the farm, engaging at various times in farm operations and the raising of cattle and horses. He was the owner of several farm properties in the district in addition to extensive real estate interests in the city itself.

A devoted Mason, he was the first Worshipful Master of St. George's Lodge, Kelowna. A keen Conservative, he was active in the counsels of his party but did not seek political preferment. For a number of years he faithfully discharged the duties of City Police Magistrate. In 1916 he joined the Royal Canadian Army Medical Corps and was medical officer of the camp at Vernon, with the rank of captain.

His memberships, ordinary and honorary, included the Canadian Legion, Kelowna Club, Canadian Club, Gyro Club, Sons of England and Rod and Gun Club. For a number of years he was Chairman of the Okanagan Loan & Investment Trust Company. One of the prime movers in founding the original Kelowna Hospital, he maintained throughout his life loyal support of that institution. His benefactions were numerous but unobtrusive. One of them was the site he presented to the Kelowna Lawn Tennis Club for the present courts. He was keenly interested in the Scout movement, to which he gave material aid.

When interviewed in May, 1940, upon the occasion of the opening of the new Hospital building, Dr. Boyce succinctly summed up his hobbies in a characteristic sentence: "I love old ladies and young children, Indians and Chinamen, and my favourite pastime is sleeping!"

The only surviving relative in the Kelowna district is a nephew, W. A. Sanborn, Mission Road. He had one sister, Mrs. Charles Osborn, Warkworth, Ont.

Dr. Charles Reginald Cumming died on October 9, in hospital, at Galt, Ont., of pulmonary embolus. He had been ailing a week but it was only the day before that he was removed to the hospital. His sudden demise was not only a great blow to his family but to a wide circle of patients and acquaintances in the city and adjoining country.

The late Dr. Cumming was born at Troy, Ont., a son of the late Mr. and Mrs. Chas. Cumming and came to Galt as a boy and had resided here ever since. He

attended Victoria and Central Public Schools, then the G.C.I. and after that graduated in medicine from Toronto University in 1906. He took postgraduate work in England and obtained his degrees of L.R.C.P. and M.R.C.S. Returning to Galt he opened a practice which he carried on for 38 years.

He had been a member of the Ontario and Canadian Medical Associations.

Dr. Cumming's chief recreations were golfing and curling, at both of which he was outstanding. He is survived by his widow, a daughter, Jessie and a son, Neil and three brothers. He was predeceased by his eldest son, Pilot Officer Charles Gordon Cumming, a prominent artist, who lost his life early in 1943 while flying with an R.C.A.F. Spitfire squadron, and a brother, Arthur.

Dr. John Healy Finnie, who held a prominent place in the medical profession for over 30 years in the city of Westmount, died September 16 following a heart attack recently. He was in his 71st year.

Born on March 20, 1875, the son of the late Dr. John T. and Amelia (Healey) Finnie, he was educated in the Montreal Collegiate Institute and Montreal High School. He graduated from McGill University as a Doctor of Medicine and Master of Surgery in 1898, and spent the next two years in postgraduate work at the Montreal General and Montreal Maternity Hospitals. In 1900 he was named medical officer of the Dominion Line vessels transporting troops to South Africa for the Boer War, and he made several trips from Montreal to Capetown during the two years.

In 1903 Dr. Finnie established himself in private practice in Coaticook, and in 1904 married Grace Ethel Evans, daughter of the late Fred W. Evans, of Montreal. Shortly after he transferred to Westmount where he built up a large private practice which he carried on until his death. He was a great lover of outdoor sports. He was a life member of the M.A.A.A., a member and past president of the Kanawaki Golf Club, and also of the Thistle Curling Club. He was a member of the Miquick Hunt Club and of the Takiteese Fishing Club, and also of the University Club of Montreal. He was a member of the Canadian Medical Association and of the Montreal Medico-Chirurgical Society and a leader in their activities for many years.

He is survived by his widow, one son, John Frederick Malcolm Finnie, of Montreal, and one daughter, Mrs. George R. Browne, of Senneville; a sister, and three brothers.

Le Dr L.-J. Gravel, doyen des médecins de l'Hôtel-Dieu, est décédé le 12 octobre. Il naquit à Montréal, le 13 octobre 1876, fils de Joseph-Alexandre Gravel, de Louiseville, et de Marie-Flore-Emilie Boucher, fille du Dr Charles Boucher, de Maskinongé. Après un cours d'étude primaire à l'école Olier, il termina ses études à l'école normale Jacques-Cartier d'où il sortit avec la plus grande distinction. En juillet 1920, il était admis à la pratique de la médecine.

Le Dr Gravel était membre de la Société Médicale. Il laisse son épouse, née Pigeon (Honora); une fille, Mme Hubert Lefebvre.

Rev. Dr. Robert A. Jaffray died some months ago in an internment camp in the Netherlands East Indies.

Dr. Jaffray was 71 years of age and is survived by his widow and daughter, Minnie Donner Jaffray and Margaret Morrison Jaffray, both at Makassar. He had been for 50 years a missionary with the Christian and Missionary Alliance and interned by the Japanese for three years.

Dr. Francis O. Mahoney, aged 58, and a native of Cornwall, died on October 7 in Vancouver, B.C., to which city he moved from Fall River, B.C., two years ago. He practised previously at Iroquois Falls, Ont., and was a graduate of the University of Toronto.

Dr. Lorne M. MacDougall died suddenly on October 3 following a heart attack.

Dr. MacDougall was the third son of the late Mr. and Mrs. W. Coleman MacDougall, of Brockville, and was born here on November 11, 1860. After attending the public schools and Collegiate Institute here, he proceeded to Queen's University, Kingston, where he graduated as a Master of Arts and Doctor of Medicine, later obtaining his Ph.D. degree at Harvard.

He is survived by his widow, one son and one daughter.

Dr. George Arthur MacIntosh died suddenly at Annapolis Royal, where he had gone on a brief visit, October 20. He was 67 years of age.

Born at Argyle, Antigonish County, he graduated from Pictou Academy and later M.D.C.M. from Dalhousie University. In 1905, following graduation, he was on the staff of the Nova Scotia Hospital, Dartmouth, as assistant to Dr. W. H. Hattie, Superintendent. During these years he published some original work on Huntington's chorea. In 1906 he went to England, where he took postgraduate work in general medicine and surgery. He then proceeded to Dublin for work in obstetrics at the Rotunda Hospital. After his return to Nova Scotia he settled in Halifax and in 1914 married Miss Clara M. Harris. During the first World War he was a captain in the R.C.A.M.C., stationed at Halifax. In 1922 he had the misfortune to lose his right arm as the result of a severe infection acquired during an operation. In 1923 he went to the Victoria General Hospital as Resident Physician, later becoming Assistant Superintendent. On the death of Mr. W. W. Kenney in 1931 he became Superintendent and continued in that capacity until ill health compelled his temporary retirement from duty in the spring of 1944.

Dr. MacIntosh had a most successful career both as a practising physician and surgeon and as a hospital administrator.

Dr. William Baxter McVey died at his residence at Rothesay, on October 1, after an illness of six months. He had practised in Saint John for a number of years. He was born at Norton, in 1866, a son of the late Andrew and Mary McVey.

Dr. McVey was a graduate of the College of Physicians and Surgeons, Harvard University, and previous to entering the medical profession, was a successful pharmacist here and in Boston, Mass. He began his medical practice in Saint John in 1900. He joined the Canadian Army Medical Corps in the first Great War. In 1916 he recruited and commanded the 8th Field Ambulance, C.E.F., and retired from military life in 1918.

He is survived by his widow, formerly Miss Selma R. Schelin, Stockholm, Sweden, and one sister.

Dr. D. Murray Meekison died recently at his home in Vancouver. He was a native of Strathroy, and graduated in arts and medicine from the University of Toronto. He served overseas with the Seaforth Highlanders of Vancouver in the first Great War, continuing as M.O. of the regiment until 1939. Following the outbreak of World War II, he enlisted with the R.A.F. After 2½ years' service overseas he returned with the rank of wing commander.

Dr. Meekison had resided in Vancouver since 1927, and was surgeon for the Crippled Children's Queen Alexandra Solarium, Vancouver Island.

Surviving are his widow, and two children.

Dr. William Fulton Meikle, aged 81, died on October 8 in Toronto. He retired 30 years ago because of ill-health.

Dr. Meikle was born in Morrisburg, son of Mr. and Mrs. William D. Meikle. He was a graduate of the University of Toronto and took postgraduate work in surgery at the Polyclinic Hospital, New York. Prior to settling in Lansdowne he practised for a few years in Morrisburg. He was a member and elder of Knox

Presbyterian Church, Morrisburg, a member of the Masonic Order and the I.O.O.F.

Surviving are his widow, Mary L. Meikle; two daughters, and four brothers, one died several years ago.

Le Dr E.-B. Rioux. Nous avons le regret d'apprendre la mort de M le docteur E.-B. Rioux, survenue subitement le 8 octobre, à la Rivière-au-Renard, comté de Gaspé, à l'âge de 56 ans. C'était un médecin très dévoué et fort estimé, aussi sa mort cause-t-elle d'unanimes regrets.

Dr. William V. Watson died on October 20 after a brief illness. He was the eldest son of the late Dr. and Mrs. A. D. Watson.

Born and educated in Toronto, Dr. Watson was a Fellow of the American College of Physicians. He served on the staff of the department of therapeutics, University of Toronto, for 20 years. He was also a member of the Royal College of Physicians, Academy of Medicine, Canadian Medical Association, Ontario Medical Association, American Therapeutic Society, Canadian Club, Empire Club and Toronto Round Table. He was president of American Therapeutic Society for 1944-45.

Dr. Watson was a life member and past president of the Toronto Camera Club. He also was a member of the Photographic Society of America, the Royal Photographic Society of London, and the Biological Photographic Association.

He is survived by his widow and two sons, Flt.-Lieut. John A. Watson, R.C.A.F., and James R. Watson; two brothers, and two sisters.

Dr. Reuben James Waugh, veteran practitioner of Carberry, died at his home on October 15. Born at Wiarton, Ont., in 1875, he graduated from Trinity Medical College in 1902 and began practice at Carberry in the following year. Dr. Waugh was not only a good doctor but a good citizen. For thirty-five years he was a member of the Carberry School Board, served as Mayor from 1937 until his retirement and represented the constituency of Norfalk in the Manitoba Legislature from 1920 to 1922. His genial disposition and sterling character won him respect and many friends.

Surviving are his widow, three sons—Sgt. Perry and Capt. George, R.C.A.M.C. overseas, and Dr. Jack Waugh practising in Winnipeg, and one daughter Frances, of Winnipeg.

News Items

Alberta

Alberta was honoured when Dr. George R. Johnson, of Calgary, was elected vice-president of the Medical Council of Canada recently. For the past twenty-three years, he has been registrar of the College of Physicians and Surgeons of Alberta.

The following physicians have been honourably discharged from the Forces: Drs. James Calder, P. H. Malcolmson, Clarence E. Holmes and Eby Quehl, of Alberta, and have returned to practise in Edmonton.

To facilitate the free distribution of penicillin to the members of the medical profession, the Provincial Department of Social Hygiene has established a depot in the offices of the Provincial Clinic at Calgary.

Of 127,051 people x-rayed for tuberculosis in Alberta until July 16, 1945, 334 were found to be "probable active" and 1,586 "probable inactive", while other abnormalities totalled 3,356.

In 1944, the death rate from tuberculosis for Alberta was the third lowest in all Canada, being 35.7 in 100,000 population, but considering the white population, the rate was only 19.7.

The following were the expenditures by the Alberta Department of Health, for the year ending March 31, 1945:

Public Health Act	$117,807.00
Insulin account	11,947.00
Social hygiene	30,929.00
Oliver Mental Hospital	281,592.00
Red Deer Training Institute	129,380.00
Ponoka Mental Hospital	479,697.00
Claresholm Auxiliary Hospital	31,290.00
Raymond Auxiliary Hospital	33,093.00
Care of poliomyelitis cases	26,483.00
Free cancer treatments	87,314.00
Free maternity hospitalization	454,950.00
Provincial Sanatorium	167,153.00
Per capita grants to hospitals	642,891.00

Dr. Eby Quehl, of Edmonton, has been discharged from the Forces and is now associated with Dr. Lobsinger in Edmonton.

Drs. P. H. Malcolmson, Walter S. Anderson, Ronald H. Horner, have been discharged from the Forces, and are again on the University staff as part-time lecturers.

Elections for members of the Council of the College of Physicians and Surgeons are called for, in the following medical districts: No. 1, Medicine Hat; No. 3, Red Deer; No. 5, Northern Alberta, and No. 7, Edmonton. This will be for a two year term 1946-47. The sitting members are eligible to run again.

Dr. L. G. Alexander, M.C., M.B.E., has returned to Calgary, and has resumed practice. He went overseas over four and a half years ago, as medical officer attached to the Calgary 14th Tank Battalion. He received the Military Cross for valour during the Dieppe landing. He went through the Sicilian campaign and was in Italy with his unit during the early warfare there. From the initial landing in Normandy to the end of the war in Germany, he was in charge of an advanced dressing station. He received the M.B.E. for exceptionally meritorious services.

G. E. LEARMONTH

British Columbia

The prospects for a medical faculty at the University of British Columbia are now very much brighter. The President of the University, Dr. Norman A. MacKenzie, has announced that plans are in hand to begin lectures in the fall of 1946, and presumably a building program will be announced later. This is very welcome news to the profession of British Columbia. It is also very welcome to the men taking pre-medical courses at the University, of whom there are 300. Most of these have no prospect of continuing their studies after their pre-medical years, unless British Columbia provides them with facilities, since all the other medical schools in Canada have their lists almost completely filled.

The perennial argument against chlorination of water in Vancouver and Victoria is now in an active stage, since the war concluded. Those who oppose it are intensely anxious to have chlorination ended, whilst the health authorities are unanimous in their opinion that it should be continued. The chief opposition comes from certain members of the City Council and from one newspaper in the city, though the latter has shown signs of being more reasonable in its attitude. There is talk of a plebiscite on the question, although it is hard to see how the man in the street

can express any opinion of any value in a matter which is strictly the business of experts and cannot be intelligently dealt with by anybody else.

For the last month or two the British Columbia Chiropodist Society has been the subject of investigation by a Royal Commission in the matter of its standards of examination. Certain men returning from overseas applied to practise here. They had been given short and in some cases correspondent courses by the Canadian Government and were not able to reach the standards set down by the Provincial Act for the admission of Chiropody. A strong protest on their behalf was made to the Attorney-General and the Provincial Secretary, and as a result the Commission was appointed to pass on the merits of the case, and to decide whether the requirements were not too high. It is to be hoped that there will be no lowering of educational and clinical standards in this matter.

Medical men are now returning in considerable numbers to British Columbia. They have, however, very great difficulty in obtaining offices and efforts are being made to ease the situation by doubling up and in other ways. Recently returned are: Lieut.-Colonel J. H. Sturdy, Lieut.-Colonel W. L. Boulter, Major A. B. Manson, Major E. J. Curtis, Capt. W. J. Endicott, Surgeon-Lieut. J. M. Murray, Colonel W. E. M. Mitchell, Major G. B. Bigelow, and Major K. J. Haig.

At the annual meeting of the Victoria Medical Society held October 1, the following officers were elected: President—Dr. T. M. Jones; Vice-president—Dr. G. B. B. Buffam; Honorary Secretary—Dr. W. E. M. Mitchell; Honorary Treasurer—Dr. A. B. Nash.

The following members were placed in office at the annual meeting of the Fraser Valley Medical Society: President—Dr. G. H. Manchester; Vice-president—Dr. J. G. Robertson; Secretary-Treasurer—Dr. J. T. Lawson. J. H. MACDERMOT

Manitoba

At the election for the provincial legislature held October 15, Drs. J. S. Poole, Neepawa; S. W. Fox, Gilbert Plains; E. J. Rutledge, Erickson, and S. O. Thompson, Riverton, were elected, the latter for the first time.

Lieut.-Col. S. A. Boyd, R.C.A.M.C., has been appointed officer commanding Fort Osborne Military Hospital. A graduate of the University of Manitoba, Lieut.-Col. Boyd served as intern in the Children's Hospital, Winnipeg, and did postgraduate work in London. He practised for six years in Winnipeg prior to enlistment in the army. Lieut.-Col. Boyd is in charge of arrangements for a reunion dinner of No. 5 Canadian General Hospital to which he was attached for several years.

Capt. Lewis Cherniak, R.A.M.C., who graduated from the faculty of medicine, University of Manitoba, in 1932, was a welcome visitor recently at the Winnipeg General Hospital while on leave to his home in Winnipeg. Capt. Cherniak saw service in Teheran and the Middle East and will return to London for further posting.

At a recent meeting of Winnipeg City Council a grant of $2,000 was approved as the city's half of a fund that will be used for preliminary investigation into the cost of construction and maintenance of the proposed Manitoba Medical Centre. The provincial government will provide a like amount.

Lieut.-Col. J. T. Stirling was elected president of the Maritime Provinces' Association of Winnipeg at its annual meeting on October 23. There were 100 members present.

Col. J. A. MacDougall, R.A.M.C., a 1932 graduate in medicine from the University of Manitoba, has been awarded the Order of the British Empire for outstanding work in medical fields. He joined the British army in 1935. At present Col. MacDougall is in charge of the R.A.M.C. in Northern Italy. His parents reside in Winnipeg.

Dr. A. E. Archer, Chairman of Council of the Canadian Medical Association, met with the Winnipeg members of the Manitoba Division executive, the committee on economics and the medical members on the Board of Manitoba Medical Service on October 7 in the club rooms of the Medical Arts Building. He discussed a number of points dealing with medical economics and the proposed health plan of the Manitoba Government, and his listeners were grateful to him for his lucid exposition and the wide extent of his knowledge not only of the medical economic position in Manitoba, but also in the other provinces.

Recent visitors seen at the Winnipeg General Hospital were Dr. Fulton Gillespie, Professor of Surgery, University of Alberta, Edmonton; Dr. G. L. Bell, Sioux Lookout, Ont.; Dr. W. A. Chestnut, of Moosomin, Sask., and Major Harold Chestnut, R.C.A.M.C., who has just returned from Palestine.

The Medical Students' Association of the University of Manitoba were host to the national convention of the Canadian Association of Medical Students and Interns (CAMSI) November 2 to 4. Guest speakers at the conference were Professor I. M. Thompson, President A. W. Trueman, Dr. F. W. Jackson, and Dr. W. W. Grant. Delegates from Dalhousie, McGill, Laval, Montreal, Toronto, Queen's, Western, Alberta and Manitoba were present. ROSS MITCHELL

New Brunswick

Dr. Liguori Richard, of Campbellton, has been appointed district medical health officer for Restigouche County. Dr. Richard graduated from Laval University in Medicine in 1943 and received his Diploma in Public Health from the University of Toronto.

Col. A. B. Walter has been demobilized after serving with the R.C.A.M.C. since the outbreak of the second great war. He held several important commands and for the last year has been consultant in medicine for the Department of Defence of Canada. Dr. Walter has now received the appointment as Director of Medicine and Chief Internist at Lancaster Hospital, Saint John.

Major Gordon Gaulton who was posted for duty at Pangnirtung, Baffin Land, is to remain at that station for another year. He reports that practice in the far north includes a great deal of difficult travel and also the necessity of supplying meat to keep his dog transportation in fit condition to travel.

Dr. A. Stanley Kirkland, of Saint John, representing the N.B. Medical Council was elected president of the Medical Council of Canada at the annual meeting in September.

Dr. Joseph Tanzman of the Obstetrical Staff of the Saint John General Hospital is taking a postgraduate course in obstetrics and gynæcology at the Post Graduate School of Columbia University.

Major H. L. Logan, of Sussex, on demobilization from the R.C.A.M.C. has resumed his duties with the N.B. Department of Health and has charge of the

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Counties of Kings and St. John. Dr. Logan commanded a hygiene section overseas.

Moncton City Hospital has completed the installation of new x-ray equipment including a deep therapy x-ray set up. The x-ray department is directed by Dr. H. R. Ripley. Press reports state that the Moncton City Hospital intends shortly to install a Department of Pathology with the service of a full time pathologist.

Dr. F. C. Jennings, of Saint John, was elected secretary of the N.B. Medical Society at the annual meeting in Edmundston, succeeding Dr. A. S. Kirkland who has held this post for the last eleven years.

Dr. Stephen D. Clark, of Fairville, N.B., was elected recently to represent his parish on the Municipal Council of Saint John City and County.

A. S. KIRKLAND

Nova Scotia

Word has been received that Col. George Ronald Forbes, of Kentville, is among the officers of the R.C.A.M.C. recently mentioned in despatches for gallant and distinguished service.

Dr. John Slater, recently discharged from the services, is about to open a practice at Bear River.

Dr. W. E. Callaghan, until recently practising in New Waterford, has left to resume practice elsewhere.

Dr. C. G. Harries, of Malagash, proposes in the near future to move to New Glasgow, where he intends to continue in general practice.

Dr. E. M. Curtis, formerly of Truro, after a period of study at the Royal Victoria Hospital, Radiological Department, Montreal, has been appointed Assistant Radiologist at the Victoria General Hospital, Halifax.

In the recent Nova Scotia election Dr. Robert McLellan of Rawdon Gold Mines, was elected a member for Hants County by a substantial majority.

Re-elected also was Dr. F. R. Davis in Lunenburg County, Minister of Health for the Province.

A Welcome Home Dinner was tendered by the Halifax Medical Society to its members who have returned from active service with His Majesty's Canadian Forces at the Nova Scotian Hotel, Halifax, October 17, 1945. One member of the Society, Lieut.-Col. Gerald B. Burns, R.C.A.M.C., died during active service in 1941. Eighteen medical members of the armed services were introduced to the Society with an individual welcome home address by a Society member. These brief addresses in each case outlined the experience of the physician in question while in the armed services, along with a record of promotions and honours received. Two absent members, Squadron-Leader Donald W. Rankin and Colonel Gordon A. Winfield, were also remembered.

Pleasant music and vocal numbers were rendered by Harry Cochrane and associated artists. One of the delightful moments of the occasion was when Dr. H. B. Atlee and Dr. Walter Muir entered, attired in unofficial battle dress, to render their tribute in song to the Society's members who were the guests of the evening.

It was a thoroughly enjoyable function and one of the best ever held by the Society.

H. L. SCAMMELL

Ontario

Colonel C. F. Abbott is D.M.O., M.D. No. 2. Colonel Abbott has a record of distinguished service overseas as officer commanding Canadian General Hospital No. 2 in France and Holland.

Lieut.-Col. F. G. Kergin has retired from the army and has resumed his position in the department of surgery, Toronto General Hospital. While overseas he was chief in surgery in No. 2 General Hospital.

Lieut.-Col. Hagar Hetherington, formerly chief in medicine, Canadian General Hospital No. 18, has retired from service and is back on duty in St. Michael's Hospital.

Group Captain Clarke Noble has returned to civil life and has resumed his practice in Toronto.

Lieut.-Col. Robert Kerr, formerly chief in surgery, Canadian General Hospital No. 21, has rejoined the staff of the Toronto General Hospital.

Group Captain A. Kelly, Secretary of the Ontario Medical Association, has been released from the Air Force and is back at his desk in the O.M.A. office.

Dr. E. C. Wilford, Chengtu, China, is on furlough in Toronto. He was guest speaker at the dinner which followed the annual meeting of O.M.A. district No. 3 in Owen Sound on October 10.

Major K. M. McIntosh has returned from overseas and is at present Assistant District Medical Officer M.D. No. 2.

A register of specialists qualified under the regulations of the Royal College of Physicians and Surgeons is being established by the College of Physicians and Surgeons of Ontario.

The announcement of an autumn Postgraduate Course by the Faculty of Medicine, Queen's University, contains a most attractive program. The course ran from November 7 to 10. Two coincidences helped in ensuring success. On November 7 the dinner and evening meeting was combined with the annual meeting of District No. 7 O.M.A. and on the last day the Queen's-Western rugby match was played in Kingston. As guest speakers the Faculty was fortunate in securing Dr. Walter C. Alvarez of the Mayo Clinic, Dr. R. P. Vivian of McGill and Dr. Magner, of Toronto.

The Department of Veterans' Affairs has announced the appointment of W/C Ray Farquharson and Brigadier J. A. MacFarlane as consultants in medicine and surgery respectively in Christie St. Hospital.

M. H. V. CAMERON

Quebec

Les autorités de l'Université Laval de Québec ont décidé d'ériger une nouvelle école de médecine et de fonder un institut d'hygiène. La présente école de médecine, érigée en 1924, est devenue beaucoup trop petite et la situation actuelle exige un agrandissement. L'Institut d'Hygiène s'occupera de la formation d'hygiénistes de carrière. Dans la nouvelle organisation, le Dr Brouha de Harvard occupera la chaire de physiologie expérimentale.

Le Dr L. M. Emard, chef d'escadrille dans l'aviation canadienne et autrefois Directeur Médical de l'hôpital Notre-Dame vient d'être nommé surintendant médical de l'hôpital militaire de Ste Anne de Bellevue.

A privately printed pamphlet entitled *Postmortem Examination and Jewish Law* has recently been prepared by Dr. I. M. Rabinowitch, special Lecturer in

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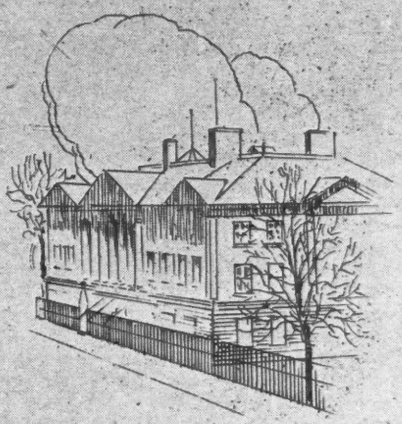

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PHYSICIAN AND STATESMAN (1821-1915)

COURAGE, boundless optimism and breadth of vision characterized the distinguished career of Sir Charles Tupper. Despite the demands of public office, he maintained an active interest in all matters concerning the medical profession.

Tupper was born at Amherst, N.S., July 2nd, 1821. He studied medicine at Edinburgh University where he received the degrees of M.D. and L.R.C.S. in 1843. Of medium height, erect, and vigorous, Charles Tupper had an abundance of nervous energy which contributed to alertness and ceaseless mental activity. His manner was hearty and genial and he had a broad grasp of most topics.

In 1862 Tupper was appointed a Governor of Dalhousie College, Halifax, where he initiated a medical course which reached full fruition in 1870. It was largely due to his persistence that in 1867 the Victoria General Hospital began its existence in Halifax as a provincial and city institution. When the Canadian Medical Association was formed in 1867 he was elected President.

The year 1855 marked the beginning of Tupper's political career. It is said that history will record the four years of his administration as Premier of the Province of Nova Scotia as the greatest era in Tupper's life—an era in which he achieved the most striking personal success. Against strong opposition he established a system of free schools for Nova Scotia.

Tupper was the apostle of Confederation and played an important part in the passage of the British North America Act. He actively supported efforts to establish a Federal Department of Health which, after much missionary work, became a reality in 1919.

He was made a Baronet in 1888. For two different periods he held the position of High Commissioner for the Dominion in London and, in 1896, was made Prime Minister of Canada.

Sir Charles died at "The Mount", Bexley Heath, England, on October 30th, 1915. The record of his life is a challenge to the medical profession and inspires William R. Warner & Company in their policy of Therapeutic Exactness . . . Pharmaceutical Excellence.

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Medical Jurisprudence at McGill University. It deals with the question whether or not Jewish Law is opposed to examination of the dead, and shows clearly that autopsy examinations which will benefit the living are permitted by this Law. The careful analysis of the question and the wealth of evidence brought forward make this volume of considerable value in hospital and medico-legal practice.

The Eighth Louis Gross Memorial Lecture was held at the Jewish General Hospital in Montreal on October 17. The Lecture was delivered by Dr. Paul D. White, of Boston, his subject being "The heart in hypertension since the days of Richard Bright". A very large and appreciative audience greeted Dr. White who is always an extremely welcome visitor to Montreal.

Dr. White's paper opened with a historical survey of the gradual advance in our knowledge of hypertension and its effects on the heart, and culminated in a review of the most recent surgical measures adopted for the relief of hypertension. These had been perfected by Smithwick, of Boston, and Dr. White gave a lucid account of the method of selection of cases and the value of the operative results up to date. At the same time he pointed out that this operation was by no means the perfect solution of the problem. Indeed he said in conclusion that whilst the value of the results from operative treatment had been notable, he would welcome a form of treatment which would not involve the extensive surgical interferences at present carried out. The operative mortality, it is true, was low, but the operation was a major one and the prolonged period of convalescence was an objectionable feature.

General

Discharged Medical Officers—Postgraduate Study.—The following extracts are taken from *Hansard,* October 15, 1945.

Mr. Nicholson:

1. What is the maximum grant available for medical officers on being discharged from the armed services, for the purpose of postgraduate study?

2. What deductions, if any, are being made for room and board, which the hospitals supply to interns, by the Department of Veterans' Affairs?

3. How much money will be available for a married doctor who is living in a hospital taking postgraduate study on D.V.A. grants?

Mr. Tucker:

1. The maintenance grant for a medical officer pursuing postgraduate studies under the provisions of the post-discharge re-establishment order is $60.00 monthly, plus additional allowances for dependents. In addition the department pays regularly university fees not exceeding $500 per academic year.

2. Full board and lodging provided to an intern by a hospital in which he is training is regarded as salary for services rendered and is valued at $30.00 a month. Where an intern's income, apart from maintenance grants, does not exceed $40 a month inclusive of board and lodging, no deduction is made from maintenance grants.

3. A doctor, married and without dependent children, living in a hospital and supporting a dependent wife in a separate establishment, would receive a monthly maintenance grant of $80, plus an additional allowance of $5 a week, or approximately $101.75 per month.

Army Dentists Fill Over Seventy-one Million Teeth.—The U.S. Army Dental Corps has made 71,500,000 fillings, 16,500,000 extractions, and 2,600,000 dentures for personnel of the Army since Pearl Harbor, according to a report by Major Robert H. Mills, Director of the Dental Division, Office of the Surgeon General.

As a result of the dental requirements of the early Selective Service program from 1940 to 1941, which required the recruit to have three natural masticating teeth and three serviceable opposing natural incisors, 8.8% of the first 3,000,000 inductees were rejected. Dental defects were the leading cause for rejection, with eye defects second and mental and nervous defects third. The dental requirements for entrance in the Army were lowered twice in 1942 to meet the need for men in military service and finally the only disqualifying factors were severe jaw malformation or malignancies.

The Army Dental Corps accepted full responsibility for rehabilitating these men who could not meet the minimum dental requirements. It was found that average dental requirements for every 100 inductees were about 60 to 80 extractions and a minimum of 240 fillings.

Twenty-seven Hundred Doctors Released from U.S. Armed Forces During September.—During September and the first four days of October, the Army Medical Department has separated 2,700 doctors from the service and by Christmas it is expected that 14,000 doctors will have been separated, Brig. General Raymond W. Bliss, Acting Surgeon General of the Army, stated recently before the House Military Affairs Committee. Through the months of July and August approximately 1,300 doctors were released.

General Bliss pointed out that in proportion to the Army's 45,000 doctors on VE-Day, there are now 43,000 in service, 2,000 of whom are recent graduates of medical schools. With the high hospital load in this country, a large number of doctors are needed to staff hospitals and separation centres, which are now at peak operation. These centres require a total of 2,000 doctors.

UNRRA in Greece.—Thirty-eight American UNRRA nurses, most of them on loan from the United States Public Health Service, are carrying vital medical supplies and nursing service to the remotest corners of Greece. In the Rome edition of *Stars and Stripes* St. Lionel Van Deerlin gives a vivid account of the difficulties under which these nurses are operating and the concrete results they are accomplishing.

"The places these nurses have been sent are not ripe with romantic possibilities", according to the army corespondent. "They are living in mountain villages accessible for most part only by donkey, and remote islands where steamers touch not more than once or twice a month".

Sgt. Van Deerlin makes clear that the work in Greece is not an all American show. "British and Canadian nurses are assigned to areas every bit as forbidding as those in which the American girls serve. The Australian Red Cross is still covering a lot of ground in Greece".

"The Germans' complete neglect of the villagers combined with native ways, left many small children in a dreadful condition. In remote areas of Greece, it is a custom to bundle babies tightly in swaddling cloth 'to give them straight backs'. Thus bound they actually stand erect if supported by the feet and balanced. When one infant about 3 weeks old was unwrapped by Miss Chladek she found the body lacerated as if with a razor."

"It looked like raw hamburger", she told Sgt. Deerlin. "I was horrified, but the midwife—all babies are delivered by midwives here—told me not to worry. The baby had been ailing and she had merely cut it up a little to 'let out bad blood'."

"Having had little instruction on the beneficial effects of air and sunshine", the account continues, "some mothers seemed reluctant to remove their children's tight wrappings, but old fashioned psychology turned the trick. The nurses offered to take pictures of all children whose clothing was removed for sunbath. In no time at all the sight of the box camera had the place looking like a juvenile Minsky's.

"Although Greek people everywhere are grateful for medical enlightenment, ancient superstitions frequently stand in the way of such help. While surveying conditions in a river village in Thessaly, Dr.

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Louise Branscomb, of Birmingham, Alabama, discovered that people drew their drinking water from a point on the river just 30 feet below where most of the town's sewage was dumped. She pointed this out to a local official, 'Oh, that doesn't matter' the man beamed, 'you see, the village church will cure us when we get sick'. On one of the remote islands in lieu of medical care, sick people were lined up and the bones of a saint were passed over their prostrate bodies."

The *Stars and Stripes* quotes Dr. Branscomb, "Nevertheless, in the year I have been bucking such beliefs as these, only one Greek has ever been rude to me—and he was a bureaucrat and not a villager."

"The main obstacle for the doctors and nurses", according to Sgt. Van Deerlin, "is the same as is faced by the entire relief program in Greece—inadequate transportation. Improvisation is possible here and there. The girls on Crete drove an abandoned German Volkswagen awhile, and now are getting the last laboured mileage out of a Kraut weapons carrier. But the basic mode of travel remains, as for centuries past, the little Greek donkey. Even if the nurses could be provided with the fleet of luxury automobiles, they couldn't reach all mountain communities. Some villages are touched only by rough mountain trails."

UNRRA in Italy.—A shipment of 900 tons of desperately needed medical supplies sent by UNRRA has arrived in Rome for distribution through Italian government authorities, and more are on the way, according to word received from Richard K. Myers, Assistant Chief of UNRRA's Medical and Sanitation Supplies Division.

Mr. Myers is in Rome to aid in supervising the distribution. The shipment was made up of 23,000 separate cases of the vital medicines and equipment. Already, 2,800 cases have been shipped to provinces most in need of them including Sicily, Lucania, Campania, Abruzzi, and Lazio and they are being distributed to hospitals and health centres for immediate use. UNRRA already has provided 100 ambulances in Italy which it obtained from military surpluses in Europe.

Any Physician May Exhibit "When Bobby Goes to School" to the Public.—Under the rules laid down by the American Academy of Pædiatrics, their educational-to-the public film, "When Bobby goes to School", may be exhibited to the public by any licensed physician in the United States.

"When Bobby goes to school" is a 16-mm. sound film, free from advertising, dealing with the health appraisal of the school child, and may be borrowed without charge or obligation on application to the distributor, Mead Johnson & Company, Evansville, Indiana.

Election of CAMSI Officers for 1946.—Robert Black, third year Medical student at McGill, was elected President of the Canadian Association of Medical Students and Interns at the annual conference of this organization in Winnipeg in November. Succeeding Harold Davies of the University of Manitoba, Black took on the duties of President recently, and announced the formation of the National Executive. Pierre-Paul Julien, of the Université de Montréal, now interning, was elected Vice-president and, with the revision of the CAMSI policy, the Secretary-Treasurer and National Director of Public Relations are also from McGill, as appointed by the President.

Refresher Courses for Demobilized Medical Officers at McMaster-Academy, Hamilton, Ont.—These courses will be held under the combined auspices of McMaster University, the Hamilton General Hospital, the Hamilton Academy of Medicine and other local institutions. The first course will commence on January 14, 1946, and be repeated on April 8, 1946. These courses will be of 11 weeks' duration. For syllabus apply to: The Secretary, Hamilton Refresher Courses for Demobilized Medical Officers, c/o Hamilton Academy of Medicine, 286 Victoria Avenue North, Hamilton, Ontario.

The offering of this course is contingent upon a minimum full course registration of eight persons per session. Applications for the first session should be received by December 31, 1945, and for the second session by March 25, 1946. While the course is in session, applications for part of the remainder of the course will be considered provided these do not make for over-crowding. The fee for the entire 11 weeks will be $100.00. The rate to be charged for part time instruction for accepted applicants will be $12.50 per week, $3.00 per day, or $25.00 for the 11 special Wednesday symposia.

Book Reviews

Artificial Pneumothorax in Pulmonary Tuberculosis. T. N. Rafferty. 192 pp., illust. $4.00. Grune & Stratton, New York, 1944.

This is a concise, well written and penetrating monograph which surveys the question of pneumothorax in relation to the broader aspects of collapse therapy. The author after a well-balanced discussion of the various aspects of this procedure, sets down the criteria which should govern its use and how it should be employed in relation to sanatorium care and a well rounded program of surgical treatment. There is good clear medical thinking here, an endeavour to examine and formulate basic principles and a refreshing constructive point of view informed by surgical experience and thorough clinical training in tuberculosis.

The author develops his subject with clarity and logic. He reviews the present status of various collapse measures, indicates the optimal conditions for pneumothorax and points out the contraindications and the danger signs. He stresses the advantages that accrue from pneumolysis and develops a well conceived program for the use of pneumothorax in relation to the whole broad problem of the treatment of the tuberculous lesion, with particular attention to questions which arise on the course of therapy.

This is the best balanced book which the reviewer has seen on this subject. It reflects the best thought in the field of tuberculosis. It serves a wide constituency and should be in the hands of every one interested in thoracic disease and particularly in the treatment of pulmonary tuberculosis.

Surgical Disorders of the Chest. J. K. Donaldson, Associate Professor of Surgery, University of Arkansas School of Medicine. 364 pp., illust. $7.50. Lea & Febiger, Phila.; Macmillan, Toronto, 1944.

Major Donaldson has written a book which will fill a long-felt need in the field of thoracic disease. It is primarily written for the average physician with the realization that chest conditions are not the primary responsibility of specialists in thoracic surgery, that the diagnostic range in this branch of disease must be widened and that a better understanding of such conditions will make for better surgery. The author also is aware of the fact that many advances in the thoracic field have not yet been incorporated into general medical thinking and practice.

The opening section deals with chest injuries and conditions of the chest wall and includes a first-rate discussion of intrathoracic physiology. The second section covers non-tuberculous intrathoracic infections. Stress is properly laid on operative intervention in lung abscess as soon as conditions permit. In respect to the relation of thrombophlebitis and pulmonary embolism and infarction the author is vague, and it is to be regretted that he could not have been more forthright in his discussion of the value of division

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of the femoral vein and of anticoagulant therapy in a problem that is so much in the medical mind at the present time. His treatment of this subject is of the academic order which he has so well avoided in other parts of the book.

Especially to be commended in this central part of the volume are a clearly outlined section dealing with iodized oil visualization, a presentation of the anatomical lung segments, the emphasis placed on early surgical treatment of bronchiectasis and a concise but adequate discussion of carcinoma of the lung.

The final section of the book deals with collapse therapy in pulmonary tuberculosis with comments on anæsthesia and the prevention and treatment of postoperative pulmonary complications. There is a particularly fine chapter setting out roentgenological patterns and their correlation with therapeutic procedures in collapse therapy. The book closes with a discussion of resuscitation and inhalation therapy.

Major Donaldson has done a praiseworthy job in making available in a compact and, above all, a useful form the best medical and surgical thought in the field of thoracic disease. The text is well illustrated with roentgenograms and surgical diagrams and (valuable item) includes full bibliographies. In this instance one can urge with sincerity the trite advice that every practitioner can benefit from this book.

Medical Gynæcology. J. C. Janney, Assistant Professor of Gynæcology, Boston University School of Medicine. 389 pp., illust. $5.75. Saunders, Phila.; McAinsh, Toronto, 1945.

This is essentially an office manual, consisting of 389 pages. It is written for the medical student and the general practitioner, for whom it provides a quick review of the subject.

Unlike most authors, Dr. Janney approaches his subject from the standpoint of the patient's complaints, and works out the logical form of history, physical examination and laboratory investigation that follows. Each chapter has incorporated in brief a summary of the differential points under discussion. This summary is found at the beginning of each new complaint studied, and is made more prominent by underlining. It occupies a page or less, and provides a quick review of the course of the investigation to follow. This page is a new and valuable addition to books of this type, and could well serve as a teaching guide for the specialist in the subject.

A short section is devoted to the tests and special examinations in gynæcology. They are so brief that they are of little or no value, and could well be omitted altogether. The brief section on irradiation or surgery in malignancy of the uterus is an expression of the author's opinion about a highly controversial subject, and would be better omitted from a book of this type.

The incorporation of sections on the preparation for marriage and on marital maladjustments are timely and well written. They outline for the general practitioner his duty in these matters, the course of investigation to follow, and the interpretation of the more common complaints. These sections alone make the book well worth having in the library of every practitioner of gynæcology.

The Fundamentals of Electrocardiographic Interpretation. J. B. Carter, Assistant (Rush) Professor, Department of Medicine, University of Illinois College of Medicine. 2nd ed., 406 pp., illust. $8.00. Thomas, Springfield; Ryerson Press, Toronto, 1945.

This is an excellent reference book for the beginner in the study of electrocardiographic interpretation. It is clearly and concisely written and only those fundamentals which have been accepted generally are discussed.

The chapters on coronary artery disease are written in considerable detail. The value and the pitfalls in the use of chest leads are discussed. A simplified technique for the recording of chest leads is presented. The author stresses the importance of serial curves in the diagnosis of coronary occlusion, and as an aid in the management of this condition. The book contains numerous electrocardiographic tracings illustrating the topic under discussion. For the most part these graphs are clearly reproduced. An important feature of the book is the extensive bibliography which follows each chapter.

Refraction of the Eye. A. Cowan, Professor of Ophthalmology, Graduate School of Medicine, University of Pennsylvania. 2nd ed., 278 pp., illust. $5.45. Lea & Febiger, Phila.; Macmillan, Toronto, 1945.

The first edition of this excellent volume appeared in 1938, since which time it has become a standard text on the subject of refraction. With this, the second edition, the material has been revised and brought up to date. There has been a slight change in the format which has permitted the use of fewer pages, though there has been no lessening of the contents.

Exercises in Human Physiology. T. Lewis, Physician in Charge of Department of Clinical Research, University College Hospital, London. 103 pp., illust. $1.10. Macmillan, Toronto, 1945.

The present small volume of exercises in human physiology reflects the late Sir Thomas Lewis' lifelong appreciation of the value of the study of physiology in man as a basis for an understanding of clinical medicine. Following the tradition of Haldane and his school in this respect, Lewis adds the further quality of direct clinical interest and application to the exercises he describes. Many of the most valuable of these were designed by Lewis himself and constituted the crucial evidence for many of our present-day concepts of human physiology; most of the others have been utilized by Lewis in his own investigations and can be found described in full in *Heart*, *Clinical Science* or in Sir Thomas' monographs "The Mechanism and Graphic Registration of the Heart Beat", "Blood Vessels of the Human Skin and their Responses" and "Pain".

The reviewer has tried out most of the exercises in medical classes and special groups and has found particularly valuable those dealing with pain. The production of pain in ischæmic muscle, the reproduction of deep and visceral pain by injection of salt solutions in muscles and tendons, and the recognition of slow and fast pathways for transmission of pain serve as the basis for the understanding and personal experience of the pain of angina pectoris, colic, etc.

The volume cannot be expected to be a complete guide to the exercises it contains in the sense of the conventional laboratory outline, nor are the results to be expected or their significance discussed in the detail they deserve. These tasks remain for the instructor to work out, after consultation with the original sources, in the light of his experience with their application to his own students.

Certain experiments the reviewer feels to be unsuited for use as student experiments in any but the most carefully controlled circumstances because of unpleasant or excessive reactions. These include the intravenous injection of adrenalin and acetyl-B-methylcholine and the intramuscular injection of as much as 50 mgm. acetyl-B-methylcholine.

BOOKS RECEIVED

Malaria in the Upper Mississippi Valley 1760-1900. E. H. Ackerknecht. 194 pp., illust. $2.00. Johns Hopkins Press, Baltimore, 1945.

Textbook of Medicine. Edited by J. J. Conybeare, Physician to Guy's Hospital, London. 7th ed., 1164 pp., illust. $9.00. Livingstone, Edinburgh; Macmillan, Toronto, 1945.